Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

AVMA Convention—San Antonio, Oct. 15-18, 1956

Contents continued on adv. pages 2 and 4

Vol. 129 **July 15, 1956** **No. 2**

curtail
erysipelas
outbreaks

Anti-Swine Erysipelas Serum

When swine erysipelas strikes, the practitioner needs a speedy, potent treatment which secures results. Hog belt veterinarians agree that Corn States anti-swine erysipelas serum and penicillin, given together, cure a surprisingly large number of cases. Use this specific serum, too, for prophylaxis, either alone or with Corn States culture, to prevent spread of infection to other swine on infected premises. The sequelae of swine erysipelas cause severe economic loss. Help your owner clients raise healthy pigs.

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Norden research* offers an entirely new product for swine erysipelas immunization

EVA

erysipelas vaccine avirulent

Maximum effectiveness
Complete safety
Thoroughly tested

Safe immunization with a live culture vaccine for maximum protection and durable immunity.

Advantages of EVA

- Avirulent for complete safety
- Live culture for high antigenic response
- Use with or without serum
- No local or systemic reactions
- Effective and economical for cyclic vaccination control plan
- No danger of self infection
- Lyophilized
- Vacuum stoppered
- 2 cc. for all weights and ages

EV—5 doses: EVLC—25 doses
With sterile diluent

Patent Pending

*Gray, C. W., Norden, Carl J., Jr.: Erysipelas Vaccine Avirulent (Eva)—A New Agent for Erysipelas Control. J.A.V.M.A., 127, (1955): 506-510.

NORDEN LABORATORIES
LINCOLN NEBRASKA

Journal of the American Veterinary Medical Association

CONTENTS

(Continued from Cover)

SURGERY AND OBSTETRICS

CLINICAL DATA

NUTRITION

CURRENT LITERATURE

Abstracts

EDITORIAL STAFF: W. A. Aitken, *Editor in Chief;* Wayne H. Riser, *Editor, Small Animal Medicine;* J. G. Hardenbergh, *Managing Editor;* Helen S. Bayless, *Assistant Editor and Advertising Manager;* Eva G. Bailey, *Assistant to the Editor.*

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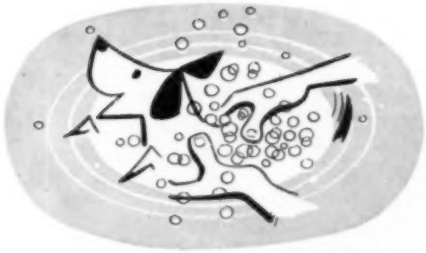
Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class mail privileges authorized at Chicago, Ill., January, 1956. Additional entry at Mendota, Ill.

the better therapeutic shampoo...



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Derisol is exceptionally effective as an easy to use, highly efficient shampoo. Its use is particularly recommended in animals with skin disease, such as pruritus, dermatitis, eczema, non-specific and seborrheic dermatoses, alopecia, dandruff, etc.

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turkeys

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Potassium Muriate	8 gr.
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Cobalt Sulfate	⅛ gr.
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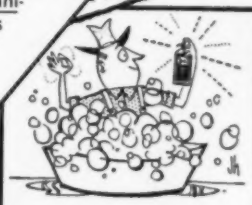

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News From Washington

This report from Dr. J. A. McCallam, the AVMA Washington representative, gives information on the Veterinary Corps situation as of June 25, latest possible date prior to closing this issue of the JOURNAL.

The Army, as monitor for the three military departments, **proceeded, as directed by Defense Secretary Wilson** on May 15, **to prepare a plan for his approval by July 1** concerning the **transfer of functions** and **elimination of the Veterinary Corps** (see JOURNAL, June 1, p. 566; June 15, adv. p. 12). It appears, however, that this **will not be accomplished as readily** as Mr. Wilson's memorandum seemed to anticipate.

The memorandum aroused much concern and many protests, indicating grave doubts about the wisdom of Secretary Wilson's action. **Many letters** have been **received by members of Congress,** from individuals and organizations, both within and **outside** the veterinary medical profession.

Secretary Wilson has also received many letters. As a significant example, one was from **Congressman Carl Vinson** (D., Ga.), chairman of the House Armed Services Committee, in which he **pointed out** to the Secretary, among other things, that the **Veterinary Corps is firmly established by law** and that the **National Service Act requires a report to the Congress** on any proposed elimination or transfer of functions within the Armed Forces.

Evidently, Mr. Wilson's reply to this letter did not assure Congressman Vinson that the joint report would be received in time for the Armed Services Committee to analyze it thoroughly, or to give it the deliberate and serious consideration which Mr. Wilson's drastic action warrants.

Mr. Vinson immediately requested Mr. Wilson to **defer any positive action until** the next session of **Congress convenes** in **January, 1957.**

Will Secretary Wilson heed the request of the chairman of the powerful Armed Services Committee?

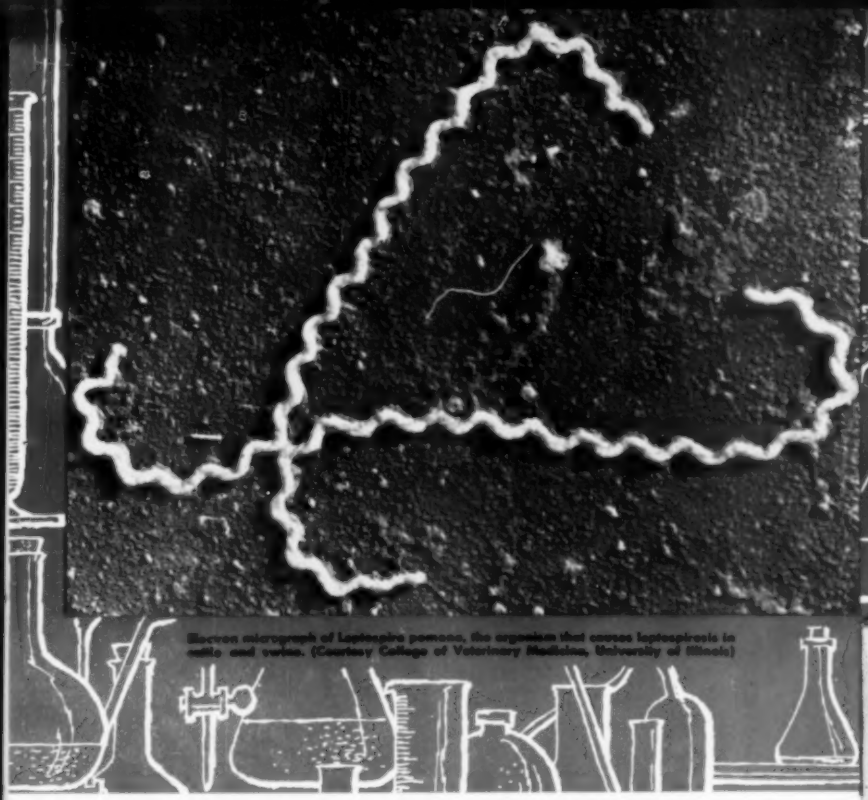
(The AVMA Washington representative takes this opportunity to acknowledge the many inquiries, letters, and other messages relative to the Veterinary Corps situation received from members, individuals, and veterinary associations; also the actions which various persons and groups have taken. Time has not permitted earlier acknowledgment and it is desired to thank all those who have been so interested and active in support of the Veterinary Corps. The total effect of their efforts is considerable. It seems likely that, finally, Congress will determine the fate of the Veterinary Corps.)

Other Developments

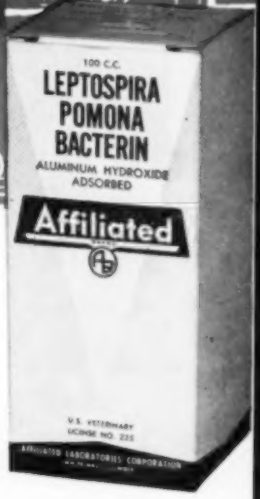
American Medical Association took a strong stand against Secretary Wilson's directive. Late in May, Secretary Lull wired several Congressional committees. This action was backed up in early June when **A.M.A. Board of Trustees expressed opposition** and its **House of Delegates** on June 12 **adopted a report** from Medical Military Affairs Reference Committee. **Reasons for A.M.A. opposition:** Elimination of Military veterinarians **would substantially increase Armed Forces requirements** for medical officers to assume Veterinary Corps functions **and** so **reduce** the **number of physicians available to serve civilian population.**

★ ★ ★ ★

The new Murray bill, S.3983 (see JOURNAL, June 1, 1956, adv. p. 8), **provides for amending** the **Meat Inspection Act,** specifically **placing poultry inspection in ARS under the Meat Inspection Branch.** The AVMA supported and urged enactment of S.3983. Hearings on these bills was resumed June 26.



Electron micrograph of Leptospira pomona, the organism that causes leptospirosis in cattle and swine. (Courtesy College of Veterinary Medicine, University of Illinois)



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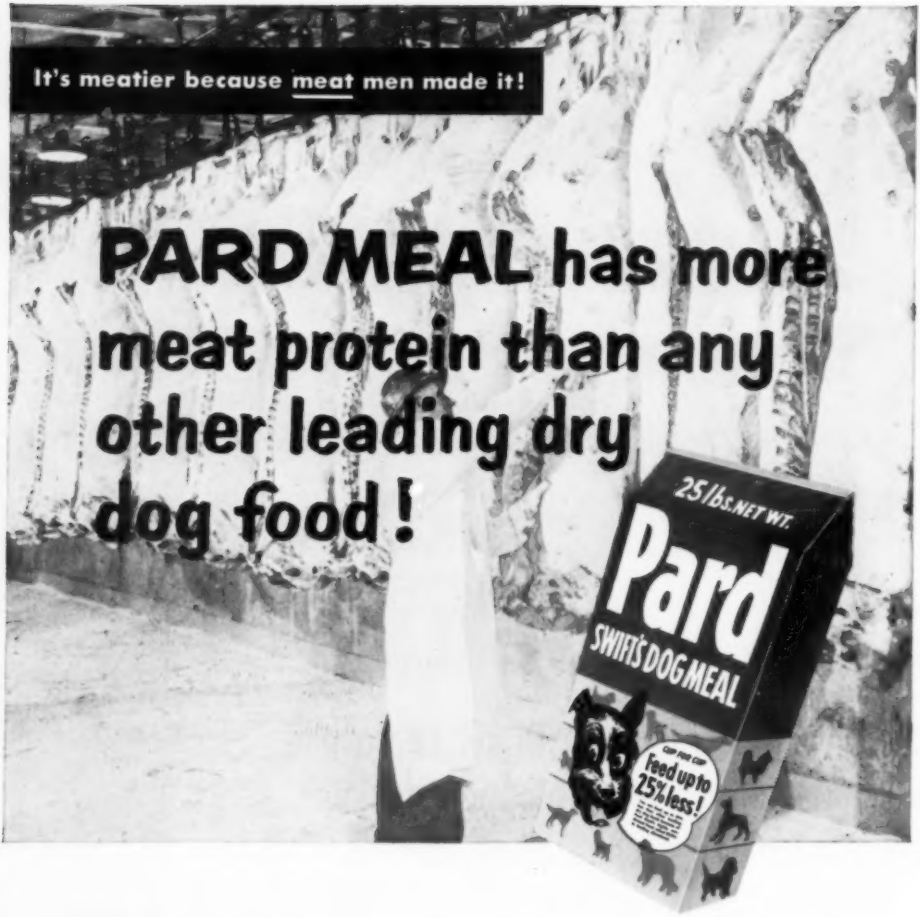

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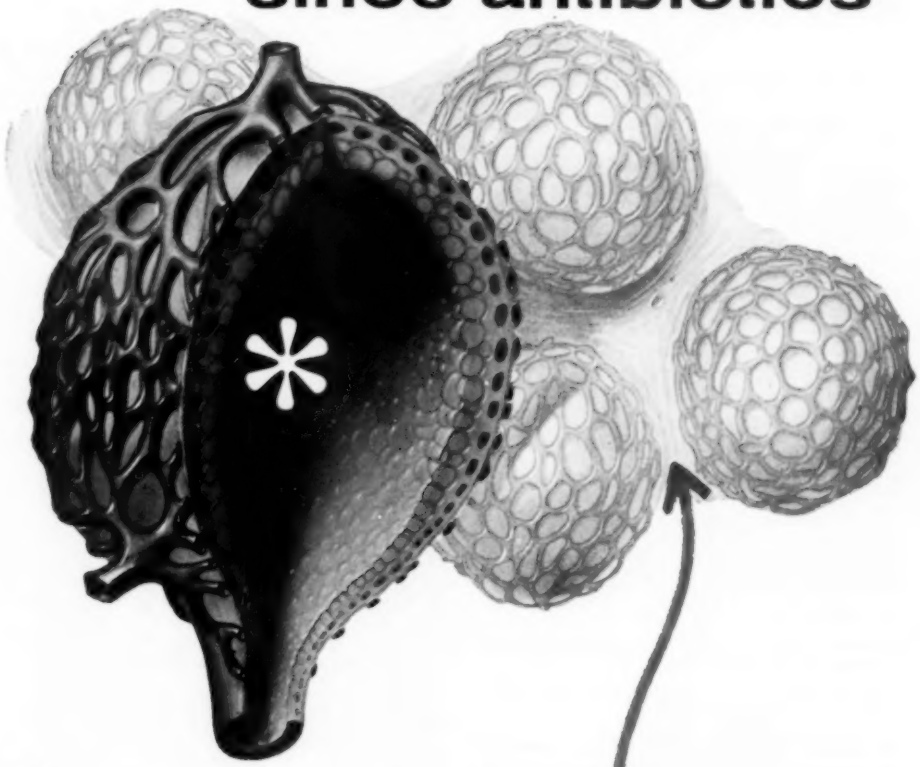

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immunizing agent against bovine leptospirosis

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

'ANTILEPTO' controls the spread of bovine leptospirosis

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Available to licensed veterinarians only.

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References: 1. Brown, A. L., et al.: Vet. Med. 50: 167, April 1955. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

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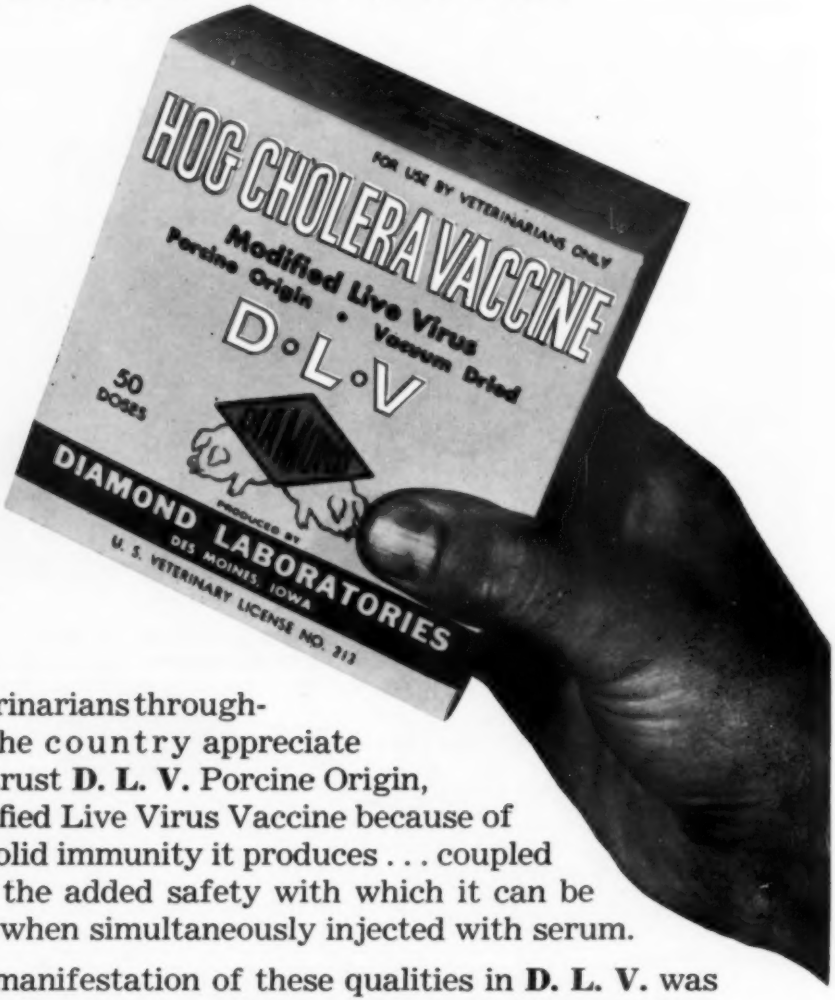

Veterinarians throughout the country appreciate and trust **D. L. V.** Porcine Origin, Modified Live Virus Vaccine because of the solid immunity it produces . . . coupled with the added safety with which it can be used when simultaneously injected with serum.

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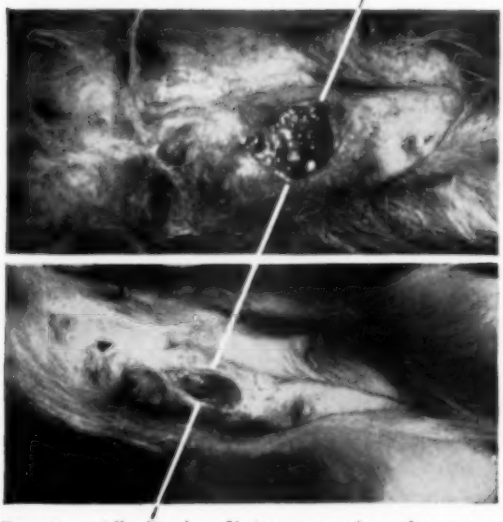

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- **Paranasal sinusitis**
- **Suppurative bursitis (fistulous withers)**
- **Suppurative arthritis**
- **Foot canker (equine)**
- **Purulent and gangrenous mastitis**
- **Pyometra and metritis**
- **Suppurative otitis**
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- **Infected amputation stumps**

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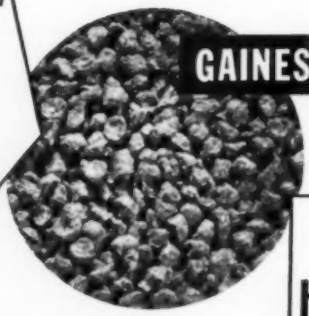

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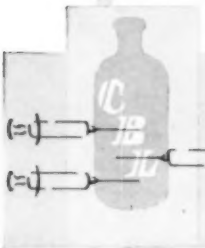

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- Maximum growth, health, vigor
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Vitamin D_3	3,700 U.S.P. units per lb.	Calcium	7.7%
Vitamin B_1	18 mg. per lb.	Phosphorus	4.6%
Vitamin B_2	36 mg. per lb.	Iodine	.0018%
Vitamin B_6	4.5 mg. per lb.	Iron	.044%
Vitamin B_{12}	activity 0.07 mg. per lb.	Cobalt	.00044%
Folic acid	1.8 mg. per lb.	Copper	.0044%
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Vitamin E	50 Int. Units per lb.		
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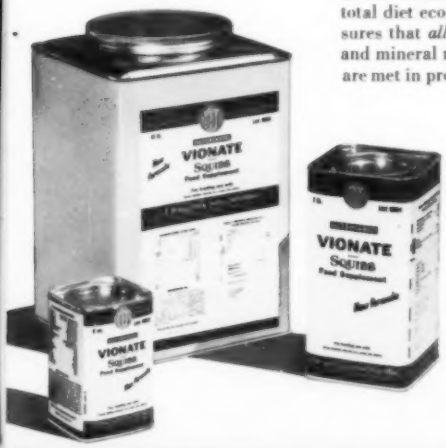

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Q. Why is worm control now important for beef and dairy cattle as well as sheep?

A. Research findings show that the great majority of beef and dairy animals also carry stomach and intestinal worms. Some infections are heavy and others are relatively light, and clinical symptoms may not always be apparent. But the condition is present—and it is costly everywhere, even in cold areas where winters were thought to suppress parasites. By USDA estimates, worms in cattle are now costing close to $40 million annually—almost equal to the figure for sheep.

Q. What new control program is being recommended?

A. After veterinary diagnosis, a worming dose or doses of phenothiazine should be given to young dairy animals, beef stock, feeder steers, or sheep. Then animals should be put on a *consistent low-level program* which supplies daily amounts of pheno. Long used for controlling worms in sheep, this practice has also proved effective in preventing cattle from becoming reinfected.

Q. Why is phenothiazine in salt especially effective for low-level feeding?

A. Because salt, an ideal carrier for pheno, is needed every day of the year by livestock; and because salt fits any feeding program. One of the best commercial products for this type of program is Sterling Green'salt—produced by the International Salt Company. Fed free choice or as the salt in feed, Green'salt has proved to be an ideal product for low-level control. It contains salt, 10% pheno, and the six essential trace minerals: iodine, cobalt, iron, copper, manganese, and zinc—as well. Daily intake of Green'salt per head should be about two tablespoons for adult cattle, one-half tablespoon for sheep.

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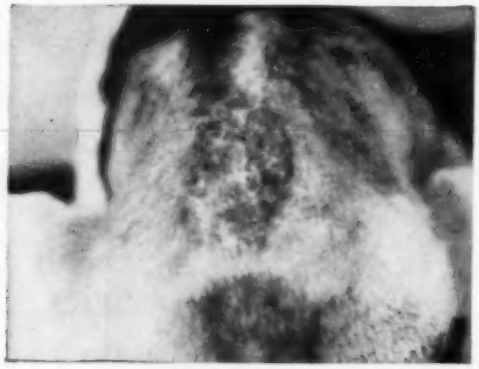

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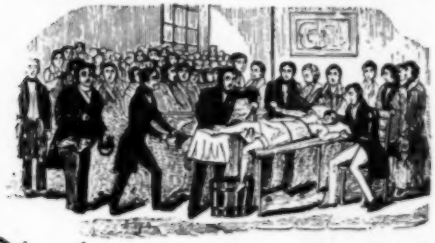

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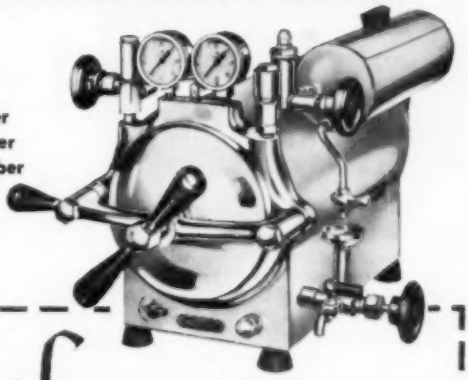

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JOURNAL
of the American Veterinary Medical Association
Chicago 5, Illinois

Vol. 129 July 15, 1956 No. 2
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Veterinary Science—Its Influence on People and Progress

DAVID D. OGILVIE, M.R.C.V.S.

New York, New York

THE ORIGINS of veterinary science are lost in the mists of antiquity. The statue of Bourgelat which stands in the courtyard of the Maison Alfort in Paris symbolizes a modern era less than two centuries old, in which veterinary science has graduated to schools and colleges, rules and regulations, and the status of a learned profession. Before that, the veterinarian entered his calling through apprenticeship. The farrier was his mentor; the horse, main source of power and transport, his subject. His position in the community was a modest one. True, his origins were as honorable as those of many others who were members of elite professions. Only a hundred years before, physicians had ceased to be ecclesiastics, surgeons had relinquished their main calling of barbering, and pharmacists had commenced their long struggle to dissociate themselves from grocers. But the veterinarian's intimate association with the stables was as yet unbroken.

EARLY PROGRESS

Nevertheless, even in the earliest days, veterinary science and veterinarians played a powerful part in the progress of mankind. No one can follow through the years their study of the horse and their development, often with uncanny judgment, of diagnoses, manipulations, and treatments via the time-honored method of acute observation after trial and error, without feeling a deep and lasting regard for them. The modern art of chemotherapy was still unborn, but even in drugs our ancient forebears were not so devoid of active agents as we might think. Chinese veterinarians were utilizing ephedrine 5,000 years ago, and the classic book of Chinese medicinal herbs compiled by Emperor Sheng Nung 3,000 years before the birth of Christ contains references to many which were used for veterinary purposes in those far-off days. Some of these herbs are being reexamined today as the basis for modern drugs.

The ancient Aztecs used oil of Chenopodium as an anthelmintic; the Arabs and the Greeks knew much about santonin; the Romans employed sulfur to deal with mange; and the Peruvian natives doctored animals with Cinchona bark long before the Jesuits brought it as a cure-all to Spain in 1633. In Europe, the therapy which began with Hippocrates in the fourth century, B.C., and was developed by Paracelsus and others, was common to man and animals and, through the centuries, mercury, antimony, and arsenic benefited or penalized them both alike.

FIRST VETERINARY SCHOOLS

The slow emergence of the veterinary profession in Europe, following the establishment of the first veterinary schools in the middle and latter years of the eighteenth century, did not, of course, have much impact upon mankind. The status of the veterinarian remained low, but the increasing importance of the horse in the development of communities, and particularly in warfare, led to improvement.

The increase in schools across Europe and beyond in the nineteenth century, the organization of professional bodies with strict codes of ethics and behavior, and the flowering of the equine veterinary art produced a veterinary force which for the first time was ready and able to influence, in an organized way, the progress and fortunes of whole peoples. This it did for the first time during the long Victorian era; through the Boer War with its tenuous supply lines and strange African dis-

Dr. Ogilvie is associated with Imperial Chemical Industries (New York), Ltd., New York, N. Y.

orders which decimated the pack animals; through the days of the horse-drawn trams, the hansom cabs, and the "growlers"; up to World War I (1914-1918) with its vast numbers of horses and mules, its sweeping epizootics of equine influenza and contagious ophthalmia, and its never-ending stream of equine casualties.

Since, in this war, horses were at times more precious than men, they had to be patched up and sent forward again with food and water, guns, shells, and all the paraphernalia of destruction. From this war, the veterinary profession emerged young in years but old in experience, and ready to move into the new fields which opened when the horse gave way to the internal combustion engine. The horse was once again, for a fleeting moment, to become vital to great enterprises. In World War II, in the Assam-Burma fighting when the Japanese threatened the whole of India, trypanosomiasis in horse transport immobilized the Allied armies. But the Veterinary Corps fought the disease with suramin and teams of inoculators and beat it, and thus another chapter in progress was written.

But all of this is in the past. What of the present and the future?

Surely the situation of olden days has undergone a swift and dramatic metamorphosis. The steady expansion of the profession in the years between the wars and since, the great developments which have taken place in agriculture, the increasing pressure of human populations on food and animal products, and the world-wide realization of the necessity of safeguarding against diseases transmissible from animals to man have ensured the veterinarian a place of influence and responsibility in modern society. And all the evidence is that he is more than justifying it.

CONQUEST OF DISEASES

Sir Thomas Dalling, of the United Nations Food and Agricultural Organization, summarized in a series of lectures, which he conducted at Leeds University, the veterinarian's progress in the world campaign for animal health. He painted a heartening picture, showing in vivid contrast the present international veterinary cooperative efforts on the one hand and, on the other, the individual struggles of countries during the nineteenth century against bovine contagious pleuropneumonia, rinderpest, and sheep pox. He outlined the steps now being taken collectively by advanced countries to deal with foot-and-mouth disease and the tremendous progress which has been made in the conquest of rinderpest which is still the most damaging of all diseases over large areas of Africa and Asia. He dealt with rabies, hog cholera, fowlpest, brucellosis, and tuberculosis against which remarkable successes have been achieved and great benefit conferred upon both animals and man. Nor did he forget bovine mastitis, probably the greatest cause of loss in milk production in all countries of the world; the many advances in the conquest of sheep diseases, notably braxy, lamb dysentery, pulpy kidney, enterotoxemia, louping ill, tick-borne fever, scrapie, and many others; and infertility in livestock which is a universal loss to the agricultural community. The elucidation of some of the mineral deficiency diseases, the classic work of Theiler in South Africa in the control of epizootic virus infections, the basic pathological studies of McFadyean, the delicate observations on avitaminosis in which the deficiency states were elucidated first in animals and then in man, as in rickets and beriberi—these are some of the milestones of veterinary progress and the contribution they have made to man's welfare is inestimable.

Indeed, right through the picture of the conquest of disease, veterinarians stand out: Guérin, a venerable and dignified figure, was elaborator, with Calmette, of BCG; Ramón, a bearded sage now in charge of the Office International des Epizooties in Paris, discovered anatoxins; his countrymen, Leclainche and Evans, opened the way to the conquest of malaria with their work on Trypanosoma in India.

Small things, too, have made their contribution. Things like the chance meeting between the parasitologist, Brumft, and the veterinarian, Crawford, in Ceylon which led to the recognition and use of *Plasmodium gallinaceum* as a screen for antimalarial drugs; the pharmacological observations on 4:4 'diaminodiphenyl sulphone in domestic animals by Francis, which led to its reinvestigation in man and eventual establishment as a cure for leprosy. Things like these have changed the lives and altered the fate of countless people.

DISTRIBUTION OF VETERINARIANS

Out of this struggle is now emerging a

global pattern of some complexity, with hopeful and disquieting features alike—the pattern of a world veterinary force capable of playing an increasingly important part in the progress and prosperity of mankind.

How great is this force and how is it being deployed? Exact global numbers of veterinarians are not known, since in some countries it is impossible to distinguish between fully qualified and properly trained veterinarians and veterinary helpers. For example, Russia claimed some years ago to have over 50,000 veterinarians, but many of these were assistants in artificial insemination centers who had had only a short course of instruction and would not be regarded as veterinarians by western standards. By and large, however, there are about 90,500 veterinarians in the world, distributed approximately in the following way: 33,000 in Europe, 2,500 in the Near East, 2,000 in Africa, 4,000 in the Indian subcontinent and South East Asia, 4,000 in the Far East, 1,000 in Australasia, 18,000 in North America, 1,000 in Central America and the Caribbean Zone, 5,000 in South America, and possibly 20,000 in the Soviet republics and their satellite countries. This relatively small force has to deal with more than 2 billion domestic animals, excluding pets and poultry.

There is, therefore, throughout the world roughly one veterinarian to every 22,000 animals. This imposes a heavy task on each and every veterinarian and it is not made easier by the uneven distribution of the profession across the world. Thus, in Britain, each veterinarian is charged with the care of approximately 10,000 farm animals, whereas in the whole of Africa, the proportion is nearer one veterinarian to every 100,000 animals, and this is also true in many parts of Asia, the Far East, and Central and South America. In both the United States and Canada, the proportion is one veterinarian to every 12,000 animals while, in Germany, Austria, Holland, Denmark, and several other European countries, it is as low as one to 5,000.

The situation in the underdeveloped countries, such as Africa, is even worse in comparison, because not only are there far too few veterinarians but there is far greater dependence on animals for transport, motive power, and clothing. Indeed, in many such countries there is a vicious circle of poor animal health, low productivity, inability or unwillingness to support veterinary services, and deprivation of the basic means of progress. Many of these communities have been aided by FAO missions, grants-in-aid under the Point Four program, and similar assistance measures; but their main problems will not be solved until their own veterinary services are more adequately staffed and the numbers of animals per individual veterinarian reduced to manageable proportions.

Of course, the lack of progress in some countries, even in those which are predominantly agricultural, is not always due primarily to shortage of veterinary personnel or to their low status. In some, it is due to poor organization; in others, to failure to apply knowledge which is already available; and in still others, it arises from the failure of the veterinary profession, itself, to think on sufficiently wide horizons and to play a sufficiently commanding role in the agricultural scene.

Knowledge, of course, always goes, or should go, before practice, but the time lag in its application is now extremely extended in some areas. Even the application on a wide enough scale of so well established a practice as routine anthelmintic dosage would produce results which would stagger more than the parasites. And, if by some magic wand all the knowledge of animal health which we now have could be applied universally, it is easy to see that many of the causes of disaffection in the troubled parts of the world would disappear.

FUTURE OF THE PROFESSION

There has been, of course, over the years a certain amount of jealousy, rivalry, or call it what you will between agriculturists and veterinarians. Unfortunately, this has been a factor which has inhibited progress in some countries. Surely the field is big enough and wide enough for both parties to have thoughts and activities in what at first sight may seem to be the other's preserve. Indeed, there are many problems of animal health now presenting themselves which can only be solved by collaboration. The intensification of agriculture will increase rather than decrease their numbers. In the cattle industry, we have much to learn about the pharmacology of various grasses and other herbage, the effects of different systems of feeding and

husbandry on fertility and productivity, the grazing habits of animals on free range and in confined paddocks, and so on. The rumen alone can be a happy hunting ground for the agriculturist, chemist, and veterinarian—the problems it presents will absorb all their energies for a long time to come. Direct questions of disease in individual animals will always require attention, but the profession as a world force will have to look beyond these if it is to play its full and rightful part in the world scene.

Beyond all these considerations, the best endeavors of the veterinary profession can be of no avail if there is political ineptitude.

In some countries, there is a reasonable veterinary force, a good appreciation of the basic problems, and a hard working, if unenlightened, agriculture, but there is little progress because there is little or no means of communication between the farmer and the veterinarian; in others, there is more concern with power than productivity; in still others, there is lethargy, unwillingness to take risks, and an attitude of *laissez faire*. In such circumstances, we can only be patient and hope by education and by demonstration that some day the light will come. In Britain, meat inspection is still largely outside of the province of the veterinarian, although he alone receives adequate training for it. In Africa, trypanosomiasis holds in its grasp 4 million acres which we could liberate with half a chance. These are the sort of examples of frustration which we must face and fight.

African trypanosomiasis demonstrates the sort of contribution which we can make to man's prosperity. It is also an example of how the greatest advances can be set to nought if the political scene is not right, for the fight against trypanosomiasis will not be won until men will it that way.

The profession has much work before it. It is in good heart and ready for all that lies ahead. Boyd Orr, I think it was, once said that ours was one of the few professions from which nothing harmful had ever arisen and nothing harmful was likely to arise. At the worst, it is a profession which has been accused on occasion of being unreasonable in its demands and of producing unreasonable people. I have been solaced in that by remembering that Bernard Shaw, in one of his inspired moments, pointed out that the reasonable man adapts himself to the world, whereas the unreasonable man persists in trying to adapt the world to himself. By that token, all progress depends on the unreasonable man and, therefore, a little sweet unreasonableness on occasion will not be out of order.

Disraeli, another fertile source of apt quotations, has said that we can not eat the fruit while the tree is still in blossom. With all due deference to that great man, this is just what is happening in the veterinary field. The world has already enjoyed much of the fruit of our labors but the full harvest has yet to come. With good husbandry, intelligent attention, and a sympathetic climate, it will surely be brought safely home.

Swine Dysentery in Australia

Vibrionic (hemorrhagic) dysentery in swine has occurred in Australia since 1938. It recently appeared in a herd of 120 shoats kept in several adjacent pens where no new animals had been added for two years and there had been no known indirect contact with other herds for six months. Thin, yellow feces were noticed in two pens several days before mucin, blood, or illness were observed. The feces then became dark, contained blood, and in 24 hours 5 pigs were dead. The disease spread through all the pens but not to sows with pigs nearby.

Sick animals responded fairly well to arsenical preparations, but attacks continued to reappear for two months, with pigs in some pens requiring re-treatment three times. Since the pigs were not marked, it was not determined whether individuals were affected more than once. After two months, the disease disappeared and pigs again ate well and put on weight but 12 (10%) had died.

Vibrios, isolated from an affected pig, were cultured and fed with gastric mucin to 2 pigs; 1 developed transient diarrhea in six days, the other typical dysentery in seven days with maximum severity in 13 days. The disease was transmitted to 6 of 7 other pigs by feeding culture or fecal material from affected pigs. The incubation period varied from four to ten days. Lesions, except for occasional pallid areas in the liver, congestion of the gastric mucosa, and excessive clear fluid in the body cavities, were confined to the cecum and colon. —*D. S. Roberts, D.V.S.C., Austral. Vet. J., Feb., 1956.*

Surgery and Obstetrics
and Problems of Breeding

Internal Fracture Fixation in Dogs and Cats

N. F. BEVINS, D.V.M., and J. L. SULLIVAN, D.V.M.

Canoga Park and Venice, California

THE PURPOSE of this paper is to describe a method of fracture fixation applicable to fractures of those long bones of the extremities of small animals not well suited to routine methods. Of particular interest are the fractures of the radius and ulna of cats and toy breeds of dogs. The method reported here embodies the use of a metal clamp applied directly to the fractured bone during open reduction. This clamp may be removed when healing is complete or it may be left permanently in the tissues.

Our results with existing methods for repair of fractures of the radius and ulna have been disappointing in some instances. We have found external splints to be awkward and not universally well-tolerated. Compound fractures, or those requiring open reduction, have been poor subjects for external fixation due to the necessity of replacing the cast at least once during the healing period. The presence of more than a moderate amount of edema in the leg presents the same problem. In the forelimb, temporary intramedullary pins are not possible as a rule in the ulna, due to its small size; however, permanent intramedullary pins are used in the radius by some veterinarians.

PROCESS OF BONE REPAIR

The repair of a closed fracture proceeds as follows: Immediately following the actual fracture, a hematocyst forms around the broken ends of the bone. This clot is then invaded by fibroblasts and angioblasts derived from the periosteum, endosteum, and linings of the haversian canals to form immature connective tissue, commonly called the soft callus. Devitalized bone from the ends of the fracture fragments is absorbed. The soft callus is transformed into the hard callus, with the deposition of calcium and the resulting formation of bone. Later, the new bone is reorganized, with a decrease in size of the bone mass.

In man, complete restoration of major bones to normal strength and structure requires about one year, although return to normal function is far quicker—frequently four to six weeks.[1-3]

Drs. Bevins, Canoga Park, and J. L. Sullivan, Venice, Calif., are small animal practitioners.

MATERIALS

The instruments used in the procedures described, as well as the clamps, were designed and built by the authors. The metal clamps were designed for direct application to both fracture fragments during open reduction. They were cut from 0.04-gauge, commercial grade, stainless steel. Hand tools were used to cut, shape, and polish each of the clamps. The forceps used in applying the clamps were constructed by modifying the jaws of selected dental forceps.

The stainless steel clamp is cut in the shape of the letter "H." The back, or cross piece, of the H is approximately ½ cm. wide and 2 cm. long overall. The arms of the H (bands which grip the bone) are ½ cm. wide and 1½ cm. long. At the time of application, the arms are clipped to a length allowing them to encompass about two thirds of the circumference of the bone. A clamp with the above dimensions would be of proper size for a transverse fracture of the radius of an adult cat. A clamp with greater length to the back, or cross piece, would be selected for an oblique fracture of a bone of this size or for a transverse fracture of a large bone. Three or four different sizes of clamps (the chief difference in size being the length of the cross piece between the arms) are kept in the fracture kit to accommodate the various sizes of bones and types of fractures (fig. 1).

The back of the clamp is slightly concave on the surface which contacts the bone. There is no attempt to make this concavity fit the bone precisely. In fact, a mechanically perfect fit is not desired, only two or three actual points of contact between the back of the clamp and the periosteum being necessary. There is likewise no attempt to secure a mechanically perfect fit between the arms of the clamp and the bone. A tight constricting band should not be produced around the periosteum at any point.

METHODS

Surgical anesthesia with pentobarbitol sodium is given intravenously to all patients. The area is shaved and scrubbed with physohex® and a sterile technique is used. A liberal incision is made in the skin on the lateral aspect of the leg directly over the fracture site and extending at least ¾ inch beyond the fracture area in each direction. The fascia is incised and the underlying muscles are parted by blunt dissection. Hemorrhage is minor. The bone should be clearly exposed ½ inch on either side of the fracture and every attempt is

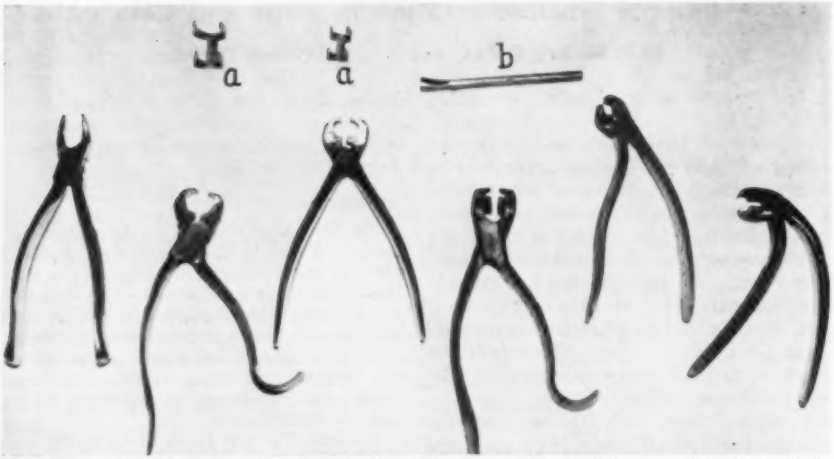

Fig. 1—Top row: (a) two sizes of clamps, fashioned from a stainless steel sheet, ready to be applied; (b) instrument used in removing clamps. Lower row: instruments for applying clamps; various sizes and types are needed.

made not to disturb the fracture hematocyst during manipulation of the bones.

The fragments are placed as nearly as possible in apposition and a clamp of appropriate size selected. The legs of the clamp are slightly bent, concavely, prior to placing on the bone. The ends of the clamp are situated ⅛ inch, or slightly more, distal to the end of the fragment with the body of the clamp bridging the fracture. The arms of the clamp are crimped around the bone, using a plier-like tool (fig. 2) until reduction is accomplished and fixation is complete.

The fascia is closed with medium chromic catgut and the skin wound with nylon suture. Light splinting for external support is used only on those fractures involving fragmentation of a segment of the bone. Penicillin is given prophylactically for two days following surgery. The time required by the actual surgery averages 20 minutes. The case reports, which follow, show the time required by different animals to regain the use of their limbs.

If it should be desired to remove the clamp, the animal is placed under surgical anesthesia. The original surgical approach to the area is duplicated until the clamp is exposed. The body of the clamp is grasped firmly in the serrated jaws of the forceps. The musculature is pulled aside exposing one of the arms of the clamp. The clamp-removing tool is then applied to the end of that arm and, while the body of the clamp is held rigid, the arm is bent slightly away from the bone (fig. 3). This process is repeated on each of the arms. The clamp is then lifted out of the wound. The wound is closed in the usual manner.

It has not been our practice to retrieve each clamp and in no case has it been necessary. However, we have removed several experimentally without experiencing any unexpected difficulties.

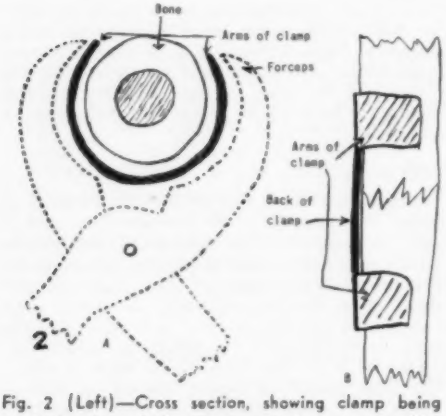

Fig. 2 (Left)—Cross section, showing clamp being applied to bone (A); side view of clamp in place (B).

CASE REPORTS

The cases presented here have all been treated within the past two years.

Case 1.—A female cat, 1½ years old, had a fracture and complete separation of the radius, including the periosteum, and also a green-stick fracture of the ulna at the same level. One clamp was applied to the radius after open reduction. The cat was using the leg on the fourth day. She jumped off a 4-foot ledge on the second day without further damaging the fracture. The clamp was removed in 26 days and the fracture was found to be healed.

Case 2.—A female Cocker Spaniel, 12 years old, had a complete fracture of radius and ulna, with overriding in the middle thirds of the bones. The fracture was reduced and the clamp applied (fig. 4). She had 70 per cent use of the leg in eight weeks. After euthanasia (for other reasons) at the end of the third month, a good soft callus formation was evident but no calcification was present at the point of fracture.

Case 3.—A female cat, 4 years old, had a fracture with overriding at the middle of the distal thirds of the radius and ulna. After open reduction and application of a clamp, the wound healed in five days, with good use of the leg by the fourth day and no detectable limp on the fifth day. She was destroyed four months after reduction and the union was found to be firm and complete. The clamp was in place and causing no visible irritation.

Case 4.—A female cat, 2 years old, had a fracture in the middle third of the femur with the distal fragment at right angles to the proximal end of the bone. Wound infection was evident on the second day after open reduction and application of the clamp. Penicillin was injected intramuscularly and instilysin® into the surgical incision. The discharge stopped on the fifth day. Recovery was then satisfactory with good use of the leg by the end of the fourth week. Radiographs showed good callus formation in three weeks.

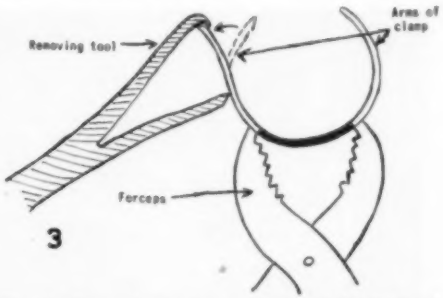

Fig. 3—Removal of clamp. Forceps hold back of clamp securely while removing tool is used to loosen arms of clamp.

Fig. 4—Actual operation (case 2), showing method of exposure of fracture and fitting of clamp for application.

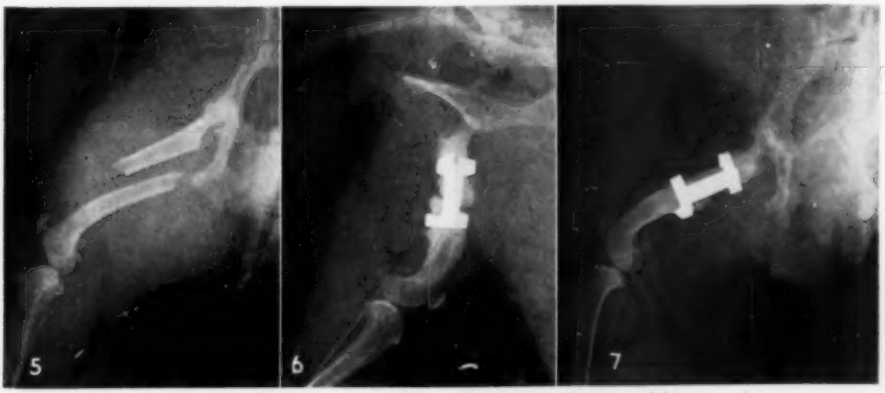

Fig. 5—Radiograph showing (case 8) transverse fracture of femur.

Fig. 6—Condition of bone (case 8) immediately following application of the clamp. Notice the cut-down fragments and the nonunion.

Fig. 7—Former nonunion of femur (case 8) six weeks after application of the clamp, showing the hard callus formation.

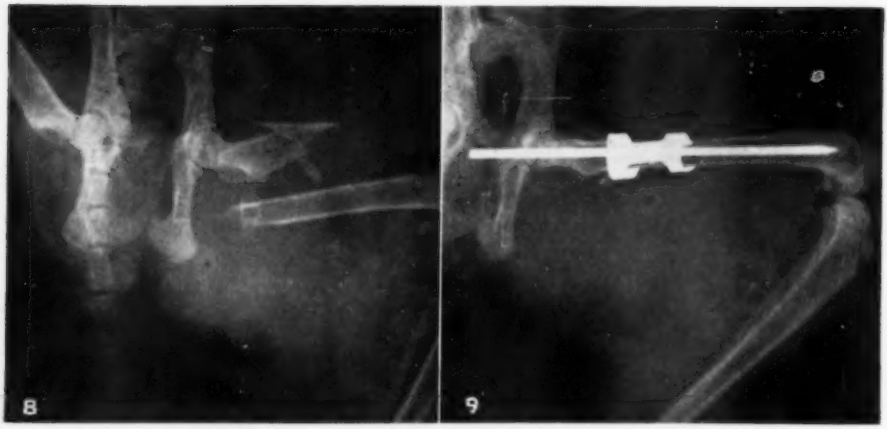

Fig. 8—Transverse fracture of femur (case 9) with fragmentation of proximal fragment.

Fig. 9—Femur (case 9) immediately following repair by means of intramedullary pin and bone clamp.

Case 5.—A female cat, 9 years old, had a transverse fracture ½ inch distal to the neck of the femur. The proximal segment was splintered into four fragments which were at a right angle to the shaft of the bone. At open reduction, an intramedullary pin was inserted through the fragmented proximal end, through the trochanteric fossa, and then extended down through the shaft of the distal fragment. A relatively long clamp was applied securely to the proximal end of the distal fragment with the proximal arms of the clamp tightened enough to bring the shattered proximal fragments into proximity but not so tight as to place undue pressure on these fragments. Splints were not applied externally. Healing was satisfactory. By the twenty-sixth day, the cat was using the leg normally, with the pin causing little or no trouble. Because of the age of the patient, the pin was not removed until the end of the third month. The clamp was left on the bone.

Fig. 10—View of hard callus formation (case 9) partly surrounding the clamp, eight weeks after the intramedullary pin had been removed.

Case 6.—A female cat, 9 months old, had fractures in the middle thirds of the radius and ulna. After open reduction and fixation with a small clamp, there was fairly good use of the leg by the fourth day. Recovery was satisfactory and the clamp was not removed.

Case 7.—A female cat, 4 years old, had a fracture of the femur with severe splintering. An intramedullary pin was inserted and a clamp applied. There was fairly good use of the leg by the end of the second week. The pin was removed after six weeks; the clamp remains.

Case 8.—A female Poodle, 5 months old, had a transverse fracture of the femur in the distal third (fig. 5). Fixation was accomplished by using an intramedullary pin, and the patient was sent home for convalescence. The pin migrated proximally, allowing movement which resulted in non-

union. During the third week, the leg was placed in a plaster cast and the animal was again sent home for three more weeks. A radiograph showed complete separation of bone fragments with excessive soft callus formation at the ends of both fragments. After open reduction, the fractured ends of the bone were cut to normal diameter and a clamp applied (fig. 6). The incision was closed and the leg was placed in a light yucca-board splint for three weeks. After another four weeks, the animal was using the leg and, after six weeks, healing was evident (fig. 7). The clamp was not removed.

Case 9.—A Siamese cat, 6 months old, had a transverse fracture of the proximal third of femur with fragmentation of the proximal portion (fig. 8). After open reduction, an intramedullary pin was inserted and a clamp firmly applied so as to bind the splintered proximal portion around the pin in a nearly normal position (fig. 9). A light yucca-board splint was applied to the leg for the first 14 days, with fairly good use of the leg within 48 hours after its removal. At the end of the fourth week, the animal was using the leg normally, so the pin was removed. A radiograph at the end of the eighth week (fig. 10) showed a large, hard callus formation. The clamp was not removed.

DISCUSSION

Internal fixation by means of a clamp of fractures of the radius, ulna, and femur has shown, in the limited number of cases, several important advantages over external splinting. The clamp produces nearly perfect alignment of the fragments; the bone is held straight with no detectable crepitation or angulation; damage to the leg and discomfort are minimal; and the normal time required for ambulation is reduced.

In 2 cases, the leg was being used normally by the fourth day and, in all cases, by the end of the third week. This early voluntary ambulation leads the observer to the assumption that little pain is felt by the patient.

Case 4, in which gross infection of the surgical wound occurred, was the only one requiring treatment with antibiotics and drainage; it healed satisfactorily in three weeks.

Since the clamp is fastened without screws or pins, there is little chance of destruction of either the bone or marrow and, since it makes contact at only a few points on each fragment of bone, it has caused no observable stricture of the periosteum. Since the clamp is not driven into the bone at any point, the normal muscle tonus pulls the fragments firmly together during the absorption of the devitalized bone and formation of the callus.

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[2]Smith, P. E., and Copenhaver, W. M.: Bailey's Textbook of Histology. Williams and Wilkins Co., Baltimore, 1948.

[3]Compere, E. L., and Banks, S. W.: Pictorial Handbook of Fracture Treatment. Yearbook Publishers, Inc., Chicago, 1952.

Studies on Bovine Vibriosis

Various laboratory animals were inoculated subcutaneously (s.c.), intraperitoneally (i.p), and intravenously (i.v.) with *Vibrio fetus* from cattle. The organism survived for a long period in the testicles, when males were injected there. Nonpregnant females showed no ill-effects but abortions occurred in pregnant females inoculated as follows: i.v. (80%); i.p. (50%), and s.c. (30%). The stage of pregnancy probably influenced the abortion rate. The organism was recovered from aborted fetuses, the uteri, and uterine discharges. —*Vet. Bull., April, 1956.*

Noninfectious Abortion in Ewes

In a flock of ewes in which a number of abortions had occurred, infectious diseases were ruled out when blood tests and cultures were negative for brucellosis, leptospirosis, and vibriosis. A possible cause was indicated when the vitamin A blood levels were found to be far below normal and the blood levels of nitrite and nitrate substances were considerably above normal. The ewes had been wintered on "drought" forages.—*A. A. Case, D.V.M., Sheep Breeder, May, 1956.*

Artificial Breeding Improves.—Reports from artificial insemination organizations throughout the United States and Canada indicate that the average for "first service nonreturn" breeding was about 70 per cent in 1955 compared with less than 55 per cent in 1940.—*Hoard's Dairyman, May 25, 1956.*

Length of Gestation in Buffaloes

Data on the gestation periods of 424 Egyptian buffaloes revealed the average length as 316.4 days. Gestation periods ending in the winter were longest (ave. 318.5 days); those in the autumn, shortest (314.5 days). Heifer calves were carried significantly longer (317.2 days) than male calves (315.7 days). Cows over 6 years of age carried their calves an average of three days longer than younger cows.—*Indian J. Vet. Sci., Dec., 1955.*

Why Insemination Bulls Are Culled

Statistics show that among the reasons bulls are lost to artificial insemination service are the following: accidents (6%), lameness (6%), sterility (5%), poor semen (4%), foreign bodies (4%), actinomycosis and actinobacillosis (2.8%), brucellosis, Johne's disease, and tuberculosis (1.4%), digestive diseases (1.1%), and other miscellaneous diseases (9%).—*N.A.A.B. News, Jan.-Feb., 1956.*

Serotonin and Hemorrhage

Serotonin, a substance found in the brain, intestine, and in blood platelets, has been considered a factor in the control of bleeding. Since it can constrict blood vessels, it was believed to be liberated from the platelets during hemorrhage to aid in the clotting process. However, serotonin can be liberated from the platelets of laboratory animals by giving them reserpine, yet the bleeding time of these animals is the same as for untreated animals.—*Science, May 11, 1956.*

Cryptorchidectomy in Pigs

After withholding food, preferably for 48 hours with water supplied freely, pentobarbital sodium is injected intraperitoneally (1 cc./4 lb.) and the pig is suspended by ropes above the hocks with the limbs slightly abducted. An incision of 1 inch or more is made into the peritoneal cavity, starting 1 inch cephalad from the external inguinal ring, retractors are applied, an inspection light introduced, and the cryptochid testicle grasped with forceps and withdrawn. The cord is ligated, the testicle removed, and the incision closed with two lines of interrupted nylon sutures.

Over 50 pigs, up to 5 months old, have been operated on without ill-effects. A similar technique can be used on cryptorchid calves less than 6 months old but they are suspended only while locating the testicle. —*R. W. Johnston, Vet. Rec., May 12, 1956.*

Segmental Epidural Anesthesia

A method of anesthetizing the entire flank of a cow, which combines the advantages of caudal epidural anesthesia and of paralumbar anesthesia, is described. It is produced by a single injection of 10 cc. or less of solution, such as 4 per cent procaine, into the first lumbar epidural space.

A 12.0-cm. needle is inserted just to the right of the lumbar spinous processes and 1.5 cm. posterior to a transverse plane through the anterior edge of the second lumbar transverse process. The needle is directed in this plane, at an angle of 10 to 13 degrees with the median plane, for 7.5 cm. After the needle is felt to penetrate the vertebral ligament, injection should be possible without pressure. However, if spinal fluid returns, the needle should be withdrawn a few millimeters before the solution is injected.

The effect is sometimes unilateral, resulting in a pronounced bending of the spine toward the anesthetized side, but the animal remains standing and may eat throughout the operation. Anesthesia was usually present in ten minutes and remained for approximately three hours. A number of cattle have been operated on successfully using this technique.—*G. H. Arthur, Vet. Rec., May 5, 1956.*

Seven virgin ewes, inoculated intravaginally at the time of breeding with the bovine strain of *Vibrio fetus* and served by artificially infected rams, did not contract the infection.—*Vet. Bull., April, 1956.*

Extensive skin defects from burns were successfully covered with amniotic membranes in two persons. The membranes were obtained at cesarotomy, with the grafting scheduled accordingly. The membranes were cut to pattern and applied by wrapping, with sutures, or a combination of these two.—*Am. J. Surg., June, 1956.*

The Control of Chronic Calf Pneumonia

G. W. ANDERSON, D.V.M., M.S., and J. P. LaMASTER, M.S.

Clemson, South Carolina

CHRONIC CALF PNEUMONIA is an insidious disease that has caused serious economic loss on dairy farms in South Carolina. The initial outbreak occurred in 1939 in a herd of purebred Jersey cattle and, until the infection was controlled in 1941, 32 calves and 8 mature animals had died. The estimated financial loss was $25,000. The disease subsequently occurred, from 1942 to 1946, in five other purebred dairy herds with a loss of 75 calves. The infection was traced to the purchase of cattle from the herd in which the disease was first recorded. From 1946 to 1954, chronic calf pneumonia occurred on ten additional dairy farms, with a mortality of 205 calves and 13 mature animals.

The calf loss in herds in which the disease has occurred has varied from 40 to 100 per cent.

THE CLINICAL DISEASE

The onset of infection is characterized by a temperature of 105 to 107 F., listlessness, anorexia, cough with protruding tongue, and purulent nasal discharge. Diarrhea occurs in some calves.

As the disease progresses, the temperature drops to normal, the cough is more frequent, the discharge from the nostrils is more profuse, and the calf becomes emaciated. The calves which do not die slowly recover. The cough, characteristic of this disease and particularly noticeable

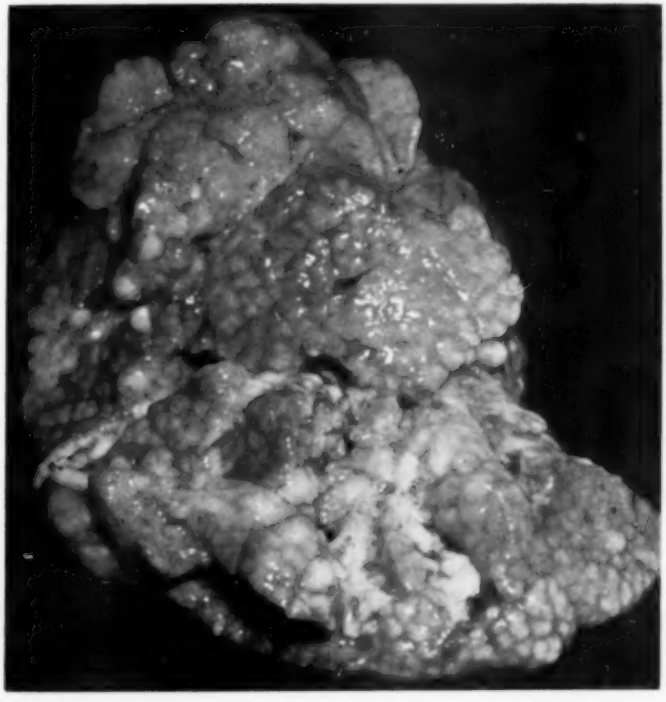

Fig. 1—The left lung of a 4-month-old calf showing the effects of chronic pneumonia.

Technical publication No. 250 from the Department of Entomology and Zoology and Department of Dairy, South Carolina Experiment Station, Clemson Agricultural College, Clemson.

Animal pathologist, Department of Entomology and Zoology (Anderson), and head, Department of Dairy (LaMaster), South Carolina Experiment Station, Clemson.

after mild exercise, is present throughout the life of those animals which recover from the early infection.

MACROSCOPIC AND MICROSCOPIC PATHOLOGY

Necropsies on 12 dead and 13 destroyed, diseased calves from ten different farms revealed the following lesions: petechial hemorrhages on the heart and kidneys, pleural adhesions to the thorax, and pericardial adhesions to the lungs. The most significant lesions occurred in the lungs. In most cases, one half to two thirds of the lung were involved and abscesses of all sizes from ⅛ inch to 6 inches in diameter were present (fig. 1). These small abscesses were caseated and those on the surface of the lungs presented a nodular appearance. The contents of the larger abscesses were yellow-green, semiliquid pus with small curdlike masses. Emphysema occurred very frequently in the apparently normal lung tissue. Microscopic study of tissue sections of the diseased lung revealed alveoli packed with neutrophilic leukocytes and cellular debris.

BACTERIOLOGY

Bacteria isolated from hearts, livers, lungs, and kidneys of the calves from the first outbreak of chronic pneumonia were *Micrococcus pyogenes* var. *albus*, *Micrococcus pyogenes* var. *aureus*, and *Corynebacterium pseudodiphtheriticum*. *Corynebacterium pyogenes*, as well as the above-named bacteria, was isolated from the organs of diseased calves in later cases.

Viruses or fungi could not be isolated from the respiratory tract of the diseased animals at necropsy.

THERAPY

In the initial herd, sulfanilamide was of no value for the sick calves either prophylactically or therapeutically.

A bacterin composed of *M. pyogenes* var. *albus*, *M. pyogenes* var. *aureus*, and *C. pseudodiphtheriticum* was prepared and administered subcutaneously in a 5.0-ml. dose to 4- to 5-day-old healthy calves in problem herds. Older healthy calves also were given the bacterin. In a two-year trial, only about 50 per cent of the calves were protected. Another bacterin was prepared containing *M. pyogenes* var. *albus*, *M. pyogenes* var. *aureus*, *C. pyogenes*, and *C. pseudodiphtheriticum*. A schedule of vaccination was developed, injecting this bacterin subcutaneously: 2.5 ml. at birth, 2.5 ml. when 1 week old, 5.0 ml. when 1 month old, and 5.0 ml. when 3 months old. This procedure protected 99 to 100 per cent of all calves treated. Additional bacterins were prepared when the infection occurred in new herds, using the causative organisms with the exception of *M. pyogenes* var. *albus*. These bacterins gave excellent protection indicating that *M. pyogenes* var. *albus* was not an important constituent of the infection.

Commercial bacterins containing the essential corynebacteria and micrococci are being used successfully at the present time. Antibiotics have been used prophylactically and as treatment in some infected calves but with variable results.

SUMMARY

1) Chronic calf pneumonia is caused by *Micrococcus pyogenes* var. *aureus*, *Corynebacterium pyogenes*, and *Corynebacterium pseudodiphtheriticum*. Viruses or fungi have not been isolated from the lungs of any of the diseased calves.

2) The calf loss in individual herds in South Carolina due to chronic pneumonia has varied from 40 to 100 per cent.

3) Infected calves show signs of typical pneumonia, with high temperature, cough with protruding tongue, purulent nasal discharge, anorexia, and listlessness.

4) The lesions most commonly found in diseased calves are large and small abscesses in the lungs, petechial hemorrhages on the heart and kidney, and pleural and pericardial adhesions.

5) Bacterins composed of *M. pyogenes* var. *aureus*, *C. pyogenes*, and *C. pseudodiphtheriticum* protected 99 to 100 per cent of calves when vaccinated at birth, 1 week, 1 month, and 3 months of age.

6) Commercial bacterins containing the essential bacteria seem to produce excellent protection in problem herds.

7) Antibiotics are only partially effective in the treatment or control of chronic calf pneumonia.

Cattle Inoculated with Rinderpest Virus.—After 21 passages in chicken embryos, cattle inoculated with rinderpest virus showed a progressive decrease in leukocyte count during the temperature reaction, then a return to normal. These changes were less apparent as the number of passages increased.—*Vet. Bull., April, 1956.*

Swine Enteritis. II. Terramycin Levels in Sow's Milk Following Intramuscular and Oral Administration

I. A. SCHIPPER, M.S., D.V.M., and D. F. EVELETH, Ph.D., D.V.M.

Fargo, North Dakota

AN ENTERIC CONDITION of suckling pigs has been described in a previous paper.[1] It was observed that the condition described could be corrected by intramuscular administration of 1 Gm. of oxytetracycline (terramycin®) to the lactating sow. The following investigation was undertaken to determine the rate of excretion, in sow's milk, of terramycin following its intramuscular or oral administration.

MATERIALS AND METHODS

Sows utilized in this investigation were of various ages and breeds, including several crossbred varieties. The sows' weights varied from 475 to 525 lb. Investigations were begun one week following farrowing to allow for maximum development of milk production and to condition the sow and litter to the milk collection procedure. The entire litter was removed from the sow one hour previous to collection of milk. When the collection of milk was to be made, the litter was returned to the sow so the nursing process would stimulate milk let-down. The milk was collected from the sow with a pump for the human breast.

Two nipples were selected and the pigs nursing these nipples were removed. The nipples were cleaned with warm water and a breast pump was applied to each. Sufficient vacuum was available to collect 5 to 10 ml. of milk from each nipple. All milk collected was stored in screw-cap vials and frozen until assayed for terramycin. All samples were assayed by the methylene blue milk method.[2]

Before the terramycin was administered, control milk samples were collected from the sow and frozen and held for assay. One gram of terramycin in 40 ml. of steriie, distilled water was injected deep into the ham muscles of each sow. A single dose of 4 oz. of animal formula terramycin (6.25 Gm. of active terramycin hydrochloride) was added to the wet feed of each sow. Attempts were made to collect milk samples at 1, 2, 4, 8, 12, 24, 36, and 48 hours after the terramycin was administered (fig. 1) but, at times, the sows refused to let down their milk so that it was necessary to omit some samples. Eleven sows were used for a total of 16 tests with intramuscular injection, while 10 sows were used for 16 tests with the oral administration of the terramycin.

Published with the approval of the director, North Dakota Agricultural Experiment Station, Fargo.

From the Department of Veterinary Science, North Dakota Agricultural College, Fargo; preliminary investigations, BJO 124—swine enteritis.

Funds in part and all terramycin for this investigation were supplied by Chas. Pfizer and Co., Terre Haute, Ind.

RESULTS

Intramuscular Administration.—The maximum concentration of terramycin was present in milk collected eight to 12 hours after injection; this value rose to 30 μg. per milliliter of milk. Therapeutic levels were present in all but three samples collected within the first three hours postinjection. In most instances, values of 8 μg. or more per milliliter of terramycin in the milk were maintained through a 12-hour postinjection period and, in some sows, for at least 24 hours (fig. 1).

Oral Administration.—Terramycin was not detected in the sows' milk before five hours following oral administration. Of 54 milk samples collected, taken between one and 36 hours postadministration, only 12 contained 1 μg. or more of terramycin per milliliter.

DISCUSSION

As previously shown, the intramuscular administration of 1 Gm. of terramycin to lactating sows appeared to be an efficient method of therapy for a described form of enteritis in suckling pigs.[1] It was also found that to correct the condition the terramycin had to be administered within 12 hours following its appearance.

Data obtained in this investigation indi-

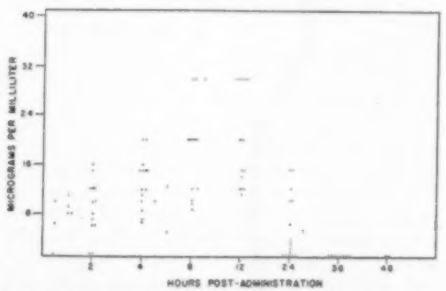

Fig. 1—Milk levels of terramycin following 16 intramuscular administrations to 11 lactating sows. Each dot represents detectable terramycin levels in a sow's milk following intramuscular administrations of 1 Gm. of terramycin.

cate that therapeutic levels of terramycin are usually present in sow's milk within one hour following intramuscular administration and are maintained for nearly 24 hours. When given to the sows in wet feed, the terramycin levels in the milk were usually erratic, required a greater period of time to appear than following intramuscular administration and, in most instances, therapeutic levels were not obtained.

This explains the previous finding that the oral administration of terramycin to sows was less efficacious in combating the enteric condition described. Furthermore, under field conditions, sows which have recently farrowed often have a mild anorexia which could prevent them from ingesting an adequate dosage of terramycin.

CONCLUSION

In 16 trials, when 1 Gm. of terramycin® was administered deep into the ham muscles of lactating sows, therapeutic levels of antibiotic were present in the milk for nearly 24 hours. This should be adequate to counteract some enteric conditions in suckling pigs. Sows given terramycin orally did not excrete appreciable quantities in the milk.

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[2]Schipper, I. A., and Petersen, W. E.: Assay of Antibiotics by Use of Methylene Blue Milk. Am. J. Vet. Res., *15*, (1954): 475-476.

Displacement of the Abomasum

Of 36 instances reported, in which the abomasum of a cow caused distress by being displaced under the rumen, only 3 occurred in cows late in pregnancy while 33 occurred from one to 28 days after calving. The pregnant uterus, by its size, seemed to be able to maintain an equilibrium which permitted normal digestion. The condition was not found in males or virgin females. The abdomen of affected cows, when viewed from behind, usually gave the impression of being "lopsided," the left lower abdomen being full and rounded while the right lower abdomen was decidedly flat. In extreme cases, the left sublumbar fossa showed a distinct bulge which did not fluctuate with the contraction of the rumen.

Replacement was attempted by: (1) withholding food and water for 36 to 48 hours; (2) casting to the left side and rolling the cow on her back, then kneading the abdomen; or (3) by rumenotomy to partially empty the rumen before forcible replacement, either by pushing the abomasum underneath the rumen or by introducing the left hand through the reticuloomasal orifice into the abomasum and pulling the latter into normal position. Of the 36 cases, 2 recovered after starvation alone, 17 after manipulation when cast, and 5 after surgery (2 were unsuspected until laparotomy). The 5 cows which responded after surgery did not regain normal health. Of the remaining 12 cows, 9 failed to respond to repeated manipulations and 3 were immediately sent to slaughter.—*H. Begg and W. A. Whiteford, Vet. Rec., Feb. 18, 1956.*

Feeding Phosphate Destroys Cattle Grubs

An organic phosphate, designated as Dow ET-57, when fed to cattle apparently prevents the development of *Hypoderma lineatus*. Other insecticides, such as aldrin, dieldrin, lindane, and diazinon, when fed or injected have prevented the survival of grubs but not their emergence. In one group of calves, treated with this phosphate after grubs began appearing in their backs, no new grubs appeared, while in untreated calves in the same lot, an average of 30 new grubs were found. Further research is necessary to determine the toxic effect on the animal and of chemical residues in the milk or flesh.—*U.S.D.A., May 4, 1956.*

Vaccination for Aujeszky's Disease

A vaccine, made of a virulent suspension of the brain of a sheep with Aujeszky's disease and adsorbed on aluminum hydroxide, was nonpathogenic for rabbits and sheep when given intramuscularly but pathogenic when given intracerebrally. Of 31 pigs inoculated subcutaneously with this vaccine, 20 resisted virulent virus given intracerebrally 21 days later, whereas all control pigs died. In field epizootics, mortality from this disease ceased 15 days after vaccination of the herd. Vaccination caused clinical cases of Aujeszky's disease in pigs recently given other vaccines such as hog cholera vaccine.—*Vet. Bull., May, 1956.*

Canine and Feline Spinal Osteoarthritis (Spondylitis Deformans)

WILLIAM C. GLENNEY, D.V.M.

Ardmore, Pennsylvania

SPINAL OSTEOARTHRITIS may be defined as an inflammation of the joints of the spinal column, with a tendency to produce bony spicules and spurs. There is a degeneration of the bone, with a tendency to fixation and ankylosis. The condition may also be called spondylitis deformans, which is described as inflammation of the vertebral joints resulting in the outgrowth of bonelike spurs which may fuse, causing ankylosis.

The two terms, spinal osteoarthritis and spondylitis deformans, may be used interchangeably. However, the former seems more descriptive and explanatory.

Spinal osteoarthritis is primarily a geriatric problem, occurring at middle age and after. However, it may occur in dogs 18 to 24 months of age, particularly when vitamin A deficiency is suspected. Signs of the ailment are more intense when the weather is humid and changeable, particularly when it changes from warm to cold. Canine spinal osteoarthritis seems to parallel the pattern of human arthritis and sinusitis. Here, on the eastern seaboard around Philadelphia, the condition is common. Treatment to ease the occasional or chronic pain is important.

Calcification of intervertebral discs probably is not related to spinal arthritis but it may be an exciting factor. The same is true of the ruptured or herniated intervertebral disc.

Whether chronic ossifying pachymeningitis is related to spinal osteoarthritis is a question because the former condition is difficult to identify radiographically. If the locomotion of the posterior portion of the body is disturbed and there are signs of central nervous changes, a diagnosis of pachymeningitis is suggested.

In spinal osteoarthritis, any of the vertebrae may be affected (fig. 1 to 4) but lesions are found predominantly in the last two or three thoracic and any of the lumbar vertebrae, the latter being the most common. Schnelle[1] aptly says "The lesion is a spur which develops on one of the articular margins of the vertebral body," causing progressive fusing and fixation of the joint. "Lipping" is observed as irregular body projections at the articular margins.[2]

Bone changes due to spinal osteoarthritis may cause stiffness, soreness, and reduced motion in the hindlegs, but seldom is there sudden paralysis or acute pain as is produced by a herniated disc. The animal learns to live with this condition. Euthanasia is necessary in only a small percentage of cases, because most patients can be helped with medication.

BREED INCIDENCE

While the number of cases included is too limited for conclusions, a recent survey of 109 animals (table 1) with spinal osteoarthritis shows the incidence fairly evenly distributed among the more popular canine breeds, except that no cases occurred in Beagles, which now lead all breeds in registrations. The highest incidence in overall disc trouble, as well as in spinal osteoarthritis, was in Dachshunds.

Table 1 needs some explanation. It probably is not typical because few sporting dogs such as Pointers, Setters, Springer Spaniels, Weimaraners, German Short-

TABLE 1—Radiographic Survey of Canine and Feline Spinal Osteoarthritis (Spondylitis Deformans) and Calcified Discs—109 Cases*

Breed	Total No. cases	Spinal osteo-arthritis only	Calcified discs only	No. cases showing both
Cocker Spaniel	29	18	8	3
Boxer	16	14	1	1
Dachshund	13	0	7	6
Mixed breeds	11	7	3	1
Boston Terrier	5	4	1	0
German Shepherd	3	3	0	0
Springer Spaniel	3	3	0	0
Wire-Haired Terrier	3	2	0	1
English Bulldog	3	2	0	1
Collie	3	3	0	0
Irish Setter	2	1	0	1
Shetland Collie	2	2	0	0
French Poodle	2	2	0	0
Fox Terrier	1	0	0	1
Cats	4	4	0	0

*Spinal Osteoarthritis (only) was found in 1 animal of each of the following nine breeds: Dalmatian, Chihuahua, Miniature Schnauzer, Pekingese, Golden Retriever, Boston Terrier, Chow Chow, Scottish Terrier, Miniature Pinscher.

Dr. Glenney is a small animal practitioner in Ardmore, Pa.

Haired Pointers, and Retrievers are present in this urban area; however, there are many Beagles.

It will be interesting to see if the incidence will increase in Beagles as it has seemed to in other breeds as their popularity brought more promiscuous breeding and retrogression in conformation.

RADIOGRAPHIC TECHNIQUE

In making spinal radiographs, a 14- by 17-inch film is usually used to permit a wider view of the spine, with due regard and allowance for shadows caused by diverging rays. A metal cassette and a high-speed screen with a Bucky are used, except on cats on which a cardboard cas-

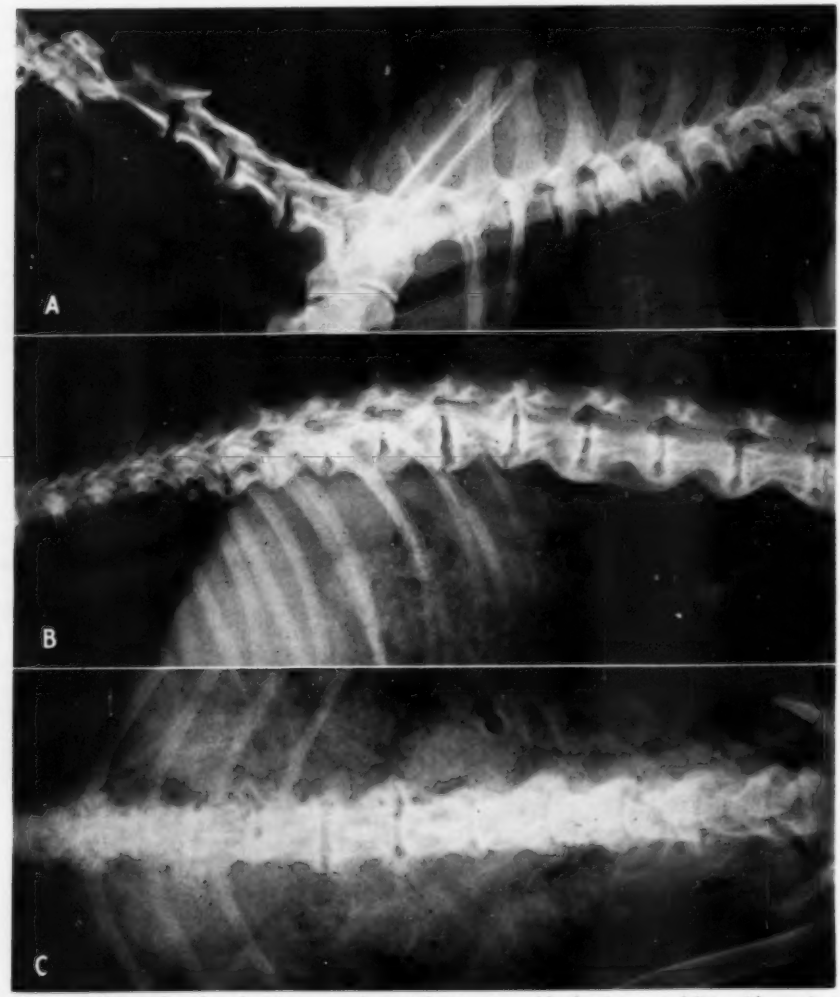

Fig. 1—Radiographs of a female mongrel spaniel, 11 years old, showing spondylitis with varying degrees of involvement of most of the vertebrae: (A) cervical and thoracic involvement (lateral view); (B) lumbar involvement (lateral view); and (C) lumbar involvement (dorsoventral view). The patient rarely seemed to be in pain.

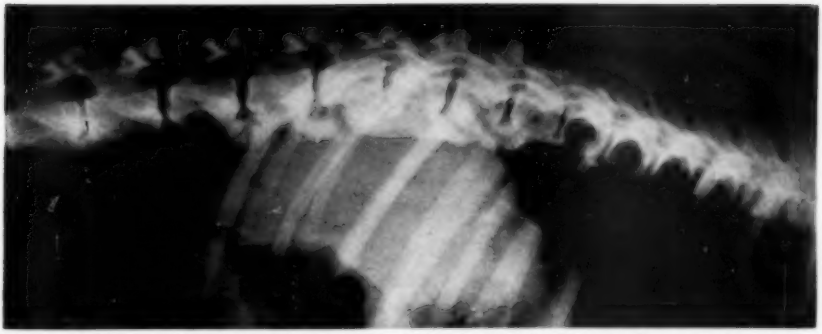

Fig. 2—Radiograph, lateral view of a male Boxer, 7 years old, showing extensive exostosis, ankylosis, kyphosis, and deformity of vertebrae. Pain was controlled by physotropin and aspirin.

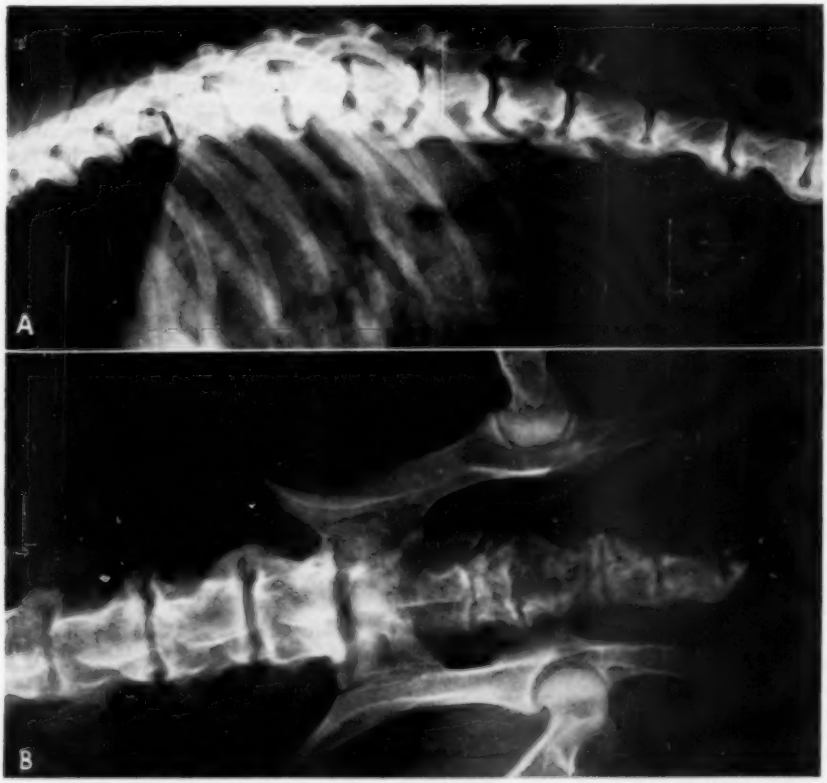

Fig. 3—Radiographs of female Boxer, 4 years old, showing generalized exostosis, ankylosis, kyphosis, and deformity of vertebrae; (A) lateral view; (B) ventrodorsal view.

Fig. 4—Radiograph of a male Wire-Haired Terrier, 14 years old, showing generalized exostosis, limited ankylosis, painful kyphosis, and deformity of the vertebrae (lateral view).

sette usually is adequate and no screen is needed. General anesthesia is used, pentothal®* or surital®† sodium being chosen because of the smooth induction and rapid recovery.

Lateral views are routinely made and, occasionally, a ventrodorsal view is taken if unusual lesions are encountered. Routine dorsoventral and ventrodorsal views will miss the majority of lesions. This is also true for disc lesions.

In order to obtain highly diagnostic radiographs of the spine, the following techniques are essential:

1) Strive for a minimum of motion by using general anesthesia, plus body bands and sandbags.

2) Increase the milliamperes (200 m.a. or to capacity of the machine).

3) The kilovoltage (kv.p.) can be varied; some recommend higher kilovoltage than recommended by most charts, which allows a shorter exposure.

4) The lowest possible time exposure is used in order to control motion. Flash exposures of 1/20 to 1/10 of a second are desirable with a Bucky and screen and 1/10 to 3/10 of a second with a cardboard holder. On the latter, the kilovoltage can be increased 25 per cent which allows for a corresponding reduction in time.

TREATMENT

Practically all recommended drugs, from aspirin to cortisone, have been used. Most of the animals respond to these two medications. Due to the expense of cortisone, some dogs are started on aspirin and switched to cortisone if aspirin is not effective. As these are usually chronic cases, cortisone tablets are dispensed with instructions to use the minimum dosage for effect. A few days of treatment may ease the pain for a variable time, from a few days to a year. Some animals demand continuous medication; others require medication two to three times a week. While on cortisone therapy, care must be exercised to prevent hemorrhage from surgery or injury, and salt and water retention should be observed. At any increase in water intake and polyuria, the cortisone should be reduced or eliminated.

A tolerance to a single drug may develop, making it necessary to alternate between aspirin, other salicylates, physotropin, and cortisone. This year, new cortisone synthetics, deltra and hydeltra,‡ were used. The dosage has been reduced to one fifth of the original 20 to 25 mg. (1 mg./2½ to 5 lb.). Both have proved superior to the old hydrocortisone with less danger of sodium and water retention and more analgesic effects.

Physical therapy has been largely abandoned for the treatment of canine osteoarthritis since the advent of cortisone. The author's diathermy machine has not been used for this condition for years. Ultrasonic therapy is also being given a trial in osteoarthritis cases.

Attention to routine geriatric problems is essential. Many arthritic patients have chronic nephritis, or hepatitis and cardiac disease. The preferred ration for these animals is K/D,§ supplemented with vitamins and minerals. Overfeeding, overmedication,

*Pentothal sodium is produced by Abbott Laboratories, North Chicago, Ill.

†Surital sodium is produced by Parke, Davis and Co., Detroit, Mich.

‡Deltra (prednisone) and hydeltra (prednisolone) are produced by Sharpe and Dohme, Division of Merck and Co., Inc., Philadelphia, Pa.

§Prescription diet, M. L. Morris, Topeka, Kan.

and overexercise should be avoided. Moderation in all treatment is advisable. Comfortable housing with controlled temperature and humidity is beneficial.

Since pain decreases as ankylosis increases, surgical fusion of the vertebrae, as has been suggested, could bring relief.

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[2]Bloom, Frank: Canine Medicine. American Veterinary Publications, Inc., Evanston, Ill. (1953): 576.

The Use of Malathion on Cats and Birds

R. F. CROSS, D.V.M., M.Sc., and
G. C. FOLGER, D.V.M.

Honolulu, Hawaii

Malathion is considered to be the safest organophosphate insecticide yet developed. Its toxicity is roughly equivalent to toxaphene® or chlordan when used on young calves.[3] Price and Bell[4] found it safe and effective for flea control in dogs when used as a dip in concentrations of 0.15 to 5.0 per cent. It has also been used, without evidence of toxicity, as a 1.25 per cent spray for chickens and as a 0.5 per cent spray for cattle.[1]

The purpose of this paper is to report its use on cats and psittacine birds. Since both cats and psittacine birds are highly susceptible to the toxic action of the commonly used chlorinated hydrocarbons, a safe insecticide with a residual action would be useful.

Cats.—Malathion was tried on a few experimental cats following a plantation manager's report that he had effectively controlled fleas by dusting his cat with a 25.0 per cent malathion powder being used for crop treatment. The cat had shown no evidence of toxicity. Experimental cats were treated with malathion powder and dipped in malathion emulsion* (table 1) without evidence of toxicity.

In an effort to produce poisoning, a 4-month-old kitten was dipped in 50.0 per cent malathion emulsion. Signs of poisoning were evident in about four hours. They consisted of vomition, excess salivation, and frequent defecation and urination. These were followed by rapid respiration, cyanosis, weakness, ataxia, and tremors. The kitten did not respond to atropine and died in approximately 48 hours. Necropsy revealed no gross lesions.

Psittacine Birds.—Thirty parakeets and 3 cockateels, confined in a large cage at the Honolulu Zoo, were heavily infested with feather mites. The mites were identified[2] as belonging to the family Dermoglyphidae. Several genera were present but the main group was Petrolichus species.

One or 2 birds from this cage had been dying each week for a period of approximately four months. This mortality was not considered serious because newly hatched birds had kept the cage population at approximately 30. All dead birds were heavily infested with mites. When the mortality increased, control measures were started.

The cage contained one, standard-sized, closed nest box for each pair of parakeets and two large boxes for the cockateels. In an effort to eradicate the mites, 1 heaping teaspoonful of 25.0 per cent malathion powder was put on the bare floor of each nest box. Since all birds entered the nest boxes, it was felt that each bird would contact the powder. No other treatment was used.

TABLE 1—Effect of Malathion on Cats

No. of cats	Method of application	Dilution of malathion	Toxicity
6	Dip	8 cc. of 50% emulsion per gallon	None
6	Dip	16 cc. of 50% emulsion per gallon	None
1	Powdered daily for 14 days	25% powder	None
1	Fed 2 Gm.	25% powder	None

Following this treatment, losses stopped. On examination of 6 birds three weeks later, no mites were found.

Comment.—These trials were limited in scope and are presented merely to report our experiences. Individual susceptibility to the insecticide may vary and small repeated doses of organophosphate compounds such as malathion can progressively lower the cholinesterase reserve until symptoms of acute poisoning result.[3] The drug should be used with caution until its relative toxicity has been established.

Malathion has been used for flea con-

From the Board of Commissioners of Agriculture and Forestry, Honolulu, Territory of Hawaii.

*Malathion source was "black leaf" 50 per cent malathion spray, emulsifiable concentrate and black leaf 25 per cent malathion wettable powder.

trol on numerous naturally infected cats with excellent results. In clinical practice, it has been used for cats either as a dip containing 2 teaspoonsful of 50.0 per cent malathion emulsion per gallon of water or as a 2.0 per cent powder. One objection to its use is an unpleasant odor which persists for three to four hours.

SUMMARY

1) Malathion was nontoxic to cats when used as a 0.2 per cent dip, applied as a powder, or given *per os* (2 Gm. of 25.0%) as indicated in table 1.

2) Malathion poisoning was produced by dipping a 4-month-old kitten in a 50.0 per cent emulsion.

3) Malathion was nontoxic for parakeets and cockateels when placed on the floor of each nest.

4) Malathion was effective in the control of feather mites.

References

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[2]Koutz, F. R.: Personal communication, 1955.

[3]Merck and Co., Rahway, N. J.: Merck Veterinary Manual. (1955): 1047.

[4]Price, M. A., and Bell, R. R.: Use of Malathion to Control Fleas in Dogs. Texas A. & M. College System, Texas Agric. Exper. Sta., Progress Rep. 1741, Dec. 31, 1954.

Feline Infectious Enteritis Studies

When a tissue suspension from a cat which died of feline enteritis was injected intraperitoneally and subcutaneously into 2 ferrets, death resulted from enteritis in seven days and inclusion bodies, resembling those of the psittacosis-lymphogranuloma group, were found in smears from the liver; they had previously been observed in smears from the liver of an infected cat. While infection was inapparent in mice, inclusion bodies were found in the liver of those inoculated intraperitoneally and in the brain of those inoculated intracranially. —*Vet. Bull., April, 1956.*

Canine Leishmaniasis in Spain.—Leishmaniasis occurs seasonally, spring and fall, in about 5 per cent of the dogs in Madrid. It is considered a danger to children. Animals with mild cases are treated with antimony compounds, the others are destroyed. —*Vet. Bull., April, 1956.*

Fibrochondro-Osteosarcoma of the Humerus of a Dog

BECKWITH HUBBELL, Jr., D.V.M.

Billings, Montana

The following case report is presented because of the rarity[1] in domestic animals of a bone tumor containing large amounts of cartilage.

In November, 1955, a 5-year-old English Setter was brought to the hospital, carrying the left foreleg and showing a painful, circumscribed swelling 8 cm. in diameter at the elbow joint. The owner stated that a number of weeks previously, the dog had fallen and hurt that leg. Recently, since the dog was thought to have arthritis, it had been given a course of cortisone, orally, with little or no relief.

Dr. Hubbel is a general practitioner in Billings, Mont.
The author expresses his appreciation to E. C. Segard, M.D., pathologist, Billings Deaconess Hospital, Billings, Mont.

[1]Feldman, W. H.: Neoplasms of Domestic Animals. Saunders and Co., Philadelphia, 1932.

Fig. 1—Radiograph of the left elbow region showing bone of the distal one third of the humerus.

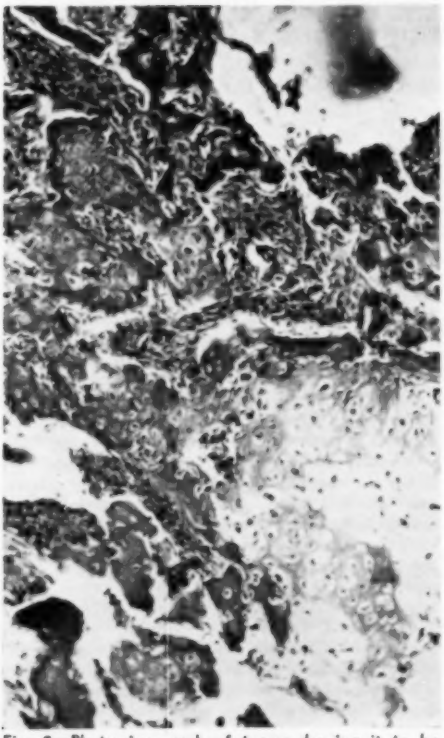

Fig. 2—Photomicrograph of tumor showing it to be composed of fibrous tissue, cartilage, and bone. x 100.

A radiograph of the joint (fig. 1) showed what appeared to be destruction of the bone and extensive exostosis of the distal third of the humerus, but not involving the humeroradial joint to any great extent. A tentative diagnosis of a tumorous condition of the lower third of the humerus was made. Because of the pain and the obvious atrophy of the shoulder muscles, the recommended procedure was either amputation of the leg above the affected area or euthanasia.

Euthanasia and necropsy were performed. The affected joint was removed intact and sent to a pathologist. The rest of the body was checked thoroughly, but no other pathological changes were noticed.

The pathologist's report follows:

Grossly, the specimen consists of an amputated elbow joint from a dog with the distal end of the humerus about 5 to 8 cm. in thickness and covered by a cartilaginous cap which, on section, consists of what appears to be neoplastic cartilaginous tissue destroying the cortex of the bone, with the central portion being extremely sclerotic.

Microscopically, decalcified sections of this specimen show pleomorphic hyaline cartilage in nests, markedly increased amounts of fibrous tissue, and bone with fairly conspicuous nuclear polymorphism (fig. 2).

The diagnosis was fibrochondro-osteosarcoma of the humerus.

Fecal Mass in Subcutis of Dog's Tail

A 3-year-old, male, crossbred Terrier had, for at least a year, a subcutaneous tumor, with a fluctuating distal portion, ventral to the base of the tail. When incised, it was found to be fecal matter, hair, and a small quantity of pus. It must have originated from the rectum but no opening could be found.—*Indian Vet. J., March, 1956.*

No Echinococcus Found in Iceland

No Echinococcus were found at necropsy of 70 dogs, after arecoline hydrobromide therapy of another 75 dogs, or at postmortem examination of about 20,000 adult sheep in various parts of Iceland. This indicates that *Echinococcus granulosus*, once prevalent, is now rare and may have been eradicated.

[This item, submitted by Dr. D. L. Bush, corrects a statement in his article (*see* JOURNAL, April 1, 1956: 329).]

Rewarding a Kitten.—Kittens will learn quicker when rewarded for progress, even if it is only a chance to play with a rubber ball or small object. However, they will learn better if the reward is food.—*Sci. News Letter, May 19, 1956.*

Whirling in Dogs Due to Confinement

Eight of 11 dogs (1 to 10 months of age), restricted to isolated cages and able to see only the ceiling, developed whirling fits. Some attacks came on spontaneously but usually they were set off by a stimulus such as restraint in a harness. The fits started with vicious growling, a "glazed" expression, running in a tight circle, shrill yelping, and tail snapping and continued for one to ten minutes. There was no evidence of infection. Their litter mates, raised normally on the same diet, showed no such behavior.—*Science, May 25, 1956.*

The Recovery of *Clostridium Hemolyticum* from the Livers and Kidneys of Apparently Normal Cattle

LOUIS DS. SMITH, Ph.D., and A. M. JASMIN, D.V.M.

Bozeman, Montana

THE SPREAD of bacillary hemoglobinuria from infected to noninfected premises is sometimes associated with the movement of cattle. This was first suggested by Records and Vawter,[1] and further evidence for this mode of transmission was provided by Safford and Smith[2] who studied the spread of this disease in Montana. They found that the first cases of bacillary hemoglobinuria in previously uninfected areas usually followed the introduction of cattle from ranches where the disease was enzootic. These workers mentioned the recovery of *Clostridium hemolyticum* from the livers of 2 apparently normal cattle but gave no details on the methods of isolation.

This report is concerned with the isolation of *Cl. hemolyticum* from the livers of 4 cattle selected from herds in which bacillary hemoglobinuria had recently occurred and from the liver of 1 animal from a ranch on which the disease had not been recognized for five years.

MEDIUMS

Peptic Digest.—Fat and connective tissue were removed from approximately 1,000 Gm. of pig stomachs. The stomachs were then ground together with 500 Gm. of beef liver and 500 Gm. of beef muscle. To this mixture was added 2 liters of water, 75 ml. of concentrated hydrochloric acid (enough to lower the pH to 1.0 to 2.0), and 10 Gm. of pepsin. This mixture was kept in a water bath of 50 to 55 C. for 24 hours. It was then heated to boiling, cooled, the fat removed, and filtered. This acid concentrate may be stored for several months in the cold. The liquid medium was made by adding 2 parts of the stock peptic digest medium to 1 part of water, adding 1.0 per cent proteose peptone and 0.025 per cent calcium chloride, adjusting the pH 7.3 to 7.5, and then sterilizing in an autoclave.

Liver Infusion Broth.—One pound of fresh beef livers was ground, added to 1 liter of tap water, and infused in the cold overnight. It was then heated to boiling to coagulate the protein, cooled to room temperature, and clarified by filtration through super-cel. This stock solution could be kept aseptically in the cold for several weeks. To prepare the broth, 1.0 per cent peptone was added and the pH was adjusted to 7.5 to 7.7, before it was placed in test tubes and sterilized. The completed medium was not stored for more than a few days.

Liver-Veal Agar.—Equal volumes of liver infusion broth and veal infusion broth were mixed and 1.0 per cent proteose peptone, 1.0 per cent agar, and 0.5 per cent glucose were added. The medium was adjusted to pH 7.6, heated to dissolve the agar, clarified by filtration, and put in tubes before being sterilized in an autoclave. This medium was prepared shortly before being used.

Blood-Agar.—Blood-agar plates were made from Difco blood-agar base with 0.3 per cent yeast extract and 0.2 per cent soluble starch added before autoclaving. Defibrinated bovine blood was added to a concentration of about 5.0 per cent before the medium was poured into Petri dishes. These plates were satisfactory for the cultivation of *Cl. hemolyticum* only for a few hours after they had been poured. Inoculated blood-agar plates were placed within Brewer jars which were evacuated of about two thirds of the air they contained, filled with hydrogen, re-evacuated, and refilled with hydrogen before the catalyst was heated.

PROCEDURE AND RESULTS

Case 1.—Six cattle were obtained for slaughter from a herd in which cases of bacillary hemoglobinuria had occurred. Diagnosis was made on the basis of symptoms and postmortem findings, but it had not been confirmed by laboratory examination. The livers of these animals had been infected by the liver fluke, *Fasciola hepatica*. Serum samples from 2 of these animals contained agglutinins against *Cl. hemolyticum*, although these cattle had not been immunized with *Cl. hemolyticum* bacterin. Four to six areas on the surface of each of the six livers were seared by heat and pieces of tissue 2 to 3 cubic inches in size were removed. These were placed in sterile Spray dishes which were incubated in anaerobic jars at 37 C. for 24 hours, to allow the multiplication of any *Cl. hemolyticum* present. Small portions of each specimen were then inoculated into tubes of peptic digest medium, which were incubated anaerobically overnight.

The cultures were centrifuged and dilu-

Contribution from the Montana Veterinary Research Laboratory (Montana Experiment Station and Livestock Sanitary Board Cooperating), Agricultural Experiment Station, Montana State College, Bozeman, paper No. 373 journal series.

tions were made of the supernatant fluid. Then, 0.1 ml. of each dilution was added to 2.0-ml. portions of egg yolk suspension (Jasmin[5]). Control tubes containing 0.1 ml. of undiluted supernatant fluid and 0.1 ml. of anti-*Cl. hemolyticum* serum, as well as egg yolk suspension, were also set up. All tubes were incubated in a water bath at 37 C. for six hours before examination. Those tubes showing flocculation of the egg yolk suspension at dilutions of 1:50 or higher, and which showed no flocculation in the serum control tubes, were considered as representing cultures possibly containing *Cl. hemolyticum*. The other cultures, most of which contained gram-positive cocci in pure culture, were discarded. Those cultures which had been found to contain lecithinase were serially diluted and the dilutions were inoculated into shake tubes of liver-veal agar. If the cultures were contaminated with cocci, they were heated at 80 C. for 20 minutes before diluting and subculturing.

Well-isolated colonies were picked from these agar shake tubes and inoculated into liver broth. Reisolation from these cultures was carried out by again making a series of dilutions of liver-veal agar. This procedure was repeated as often as seemed necessary to insure pure cultures. These cultures were inoculated into peptic digest medium and toxin production was determined by the intravenous inoculation of culture filtrates into white mice. The neutralization of the toxin by *Cl. hemolyticum* antitoxin was also determined, as was agglutinability and the usual cultural characteristics.

Clostridium hemolyticum was isolated from one of the six livers examined by this method. This liver came from 1 of the 2 animals showing an appreciable agglutinin titer.

Case 2.—This animal was from a herd of 87 cattle in which bacillary hemoglobinuria had caused about 10 per cent mortality before vaccination was carried out. Just before this herd was vaccinated, blood samples were taken, and the serums of 18 animals were found to contain agglutinins for *Cl. hemolyticum*. The animal showing the highest agglutinin titer was slaughtered one month after vaccination and isolation procedures were carried out on the liver and kidney as in case 1. *Clostridium hemolyticum* was recovered from the liver.

Case 3.—This animal came from a herd of cattle in which bacillary hemoglobinuria had recently appeared. Blood samples were taken just before vaccination and the serum of 1, 2-year-old heifer showed a high titer of agglutinins to *Cl. hemolyticum*. It also showed appreciable antitoxic activity. This heifer had originally come from a ranch on which bacillary hemoglobinuria had been known to be present and she had been vaccinated with *Cl. hemolyticum* bacterin. At slaughter, all organs appeared to be normal with no evidence of fluke infection of the liver. Kidney, spleen, liver, metacarpus, and parts of the small and large intestine were collected for bacteriological examination.

Ten specimens from each organ and ten specimens from the bone marrow were removed aseptically and inoculated into tubes of liver broth which were incubated anaerobically for three days. All cultures showing growth of medium-to-large gram-positive or gram-negative rods were plated on fresh blood-agar. Plates of this medium were also inoculated just after they had been poured, but before they had hardened, to obtain subsurface colonies. After two days' incubation in anaerobic jars, these plates were examined and colonies surrounded by an area of diffuse hemolysis were transferred to tubes of peptic digest medium. After incubation overnight under anaerobic conditions, these cultures were centrifuged, the sedimented cells were tested for agglutination with diluted anti-*Cl. hemolyticum* serum, and the supernatant fluid was tested for lecithinase activity neutralized by *Cl. hemolyticum* antitoxin. Strains of organisms that had agglutinated with anti-*Cl. hemolyticum* serum and that had produced lecithinase which could be neutralized by *Cl. hemolyticum* antitoxin were replated in blood-agar and the usual cultural characteristics were determined.

Clostridium hemolyticum was isolated from each of the ten specimens taken from the liver and from two of the ten specimens taken from the kidney. It was not isolated from any of the specimens taken from the spleen or bone marrow.

Small samples (0.01 to 0.1 ml.) of contents from the small and large intestines were inoculated into tubes of liver broth, which were then heated at 95 C. for 15 minutes and incubated anaerobically for three days. They were then plated on, and in, blood-agar as previously described. *Clostridium hemolyticum* was not isolated from

any of these specimens of the intestinal contents. The results of a comparative investigation in which normal intestinal contents were deliberately contaminated with *Cl. hemolyticum* indicated that recovery of this organism was unlikely unless several thousand spores of *Cl. hemolyticum* were present per gram.

Case 4.—This animal came from a nonvaccinated herd in which bacillary hemoglobinuria had occurred for the first time. It was selected for slaughter because of the agglutinin content of its serum. However, the serum did not contain demonstrable antitoxin. Twenty specimens were taken from the liver, ten from the spleen, ten from the kidney, and were transferred to liver broth. The succeeding steps in the bacteriological examination were identical with those described in case 3. *Clostridium hemolyticum* was isolated from seven of 20 liver specimens but not from the spleen, kidney, or intestinal contents.

Case 5.—All of the preceding cases were animals from herds recently affected by bacillary hemoglobinuria. In this instance, the animals were from a ranch on which bacillary hemoglobinuria had occurred five years before. Since that time, all cattle on this ranch had been vaccinated every six months with *Cl. hemolyticum* bacterin and no further cases of bacillary hemoglobinuria had occurred. The 15 yearling heifers used in this examination had been vaccinated six months before slaughter and the serums of all showed agglutinins for *Cl. hemolyticum*. The serum of 1 animal contained a demonstrable amount of antitoxin.

The livers of 13 of these animals appeared normal; the livers of 2 showed evidence of healed abscesses. There was no evidence of fluke infection. Ten specimens were taken from each liver for examination as in case 3. The bile from each gallbladder was centrifuged and the sediment was cultured in liver broth. Two specimens from the liver of 1 animal yielded cultures of *Cl. hemolyticum*. This was the animal whose serum had contained antitoxin. *Clostridium hemolyticum* was not isolated from the specimens of bile.

We were not always successful in finding *Cl. hemolyticum* in the livers of cattle that we suspected might be carrying this organism. On two different occasions, 2 cattle with agglutinins for *Cl. hemolyticum* were slaughtered and the livers were examined bacteriologically. In none of these 4 animals was *Cl. hemolyticum* found. There was no way, of course, of telling whether this organism was absent or whether it was present in such small numbers that the method of isolation was inadequate. Many liver specimens from apparently normal cattle contain cocci and some contain *Clostridium perfringens*. When these organisms outnumber *Cl. hemolyticum*, the task of isolating the latter becomes difficult.

DISCUSSION

These isolations of *Cl. hemolyticum* show that immunization of cattle by vaccination does not prevent them from carrying viable *Cl. hemolyticum* in their livers. The presence of antitoxin in the serums of 2 of these animals (cases 3 and 5) probably indicates an appreciable amount of growth of the organism within the tissues with the release of sufficient toxin to stimulate the antibody-forming mechanism. It is likely that a state of equilibrium has been reached between the bacteria and the host. In these cases, the resistance of the host is sufficient to prevent the uncontrolled multiplication of the organism with consequent disease, but it is insufficient to cause the destruction or removal of the bacteria by the normal defense mechanisms.

It appears that infection of the bovine liver by *Cl. hemolyticum* does not necessarily result in the development of bacillary hemoglobinuria. The infection may be undetectable clinically, as in the cases reported here. It may be responsible for atypically mild attacks such as have been observed by veterinarians practicing in the bacillary hemoglobinuria areas, or it may bring about the more common, rapidly fatal disease that is considered characteristic.

The possibility that the animals which carry *Cl. hemolyticum* in their livers are involved in the spread of the disease into new areas is, unfortunately, still an open question. The demonstration of *Cl. hemolyticum* in the kidneys of 1 animal (case 3) opens up the possibility that the organism may be excreted with urine. Likewise, it is possible that *Cl. hemolyticum* could be passed with the bile from the liver to the small intestine, from whence it could be excreted with the feces. However, we were unable to demonstrate this organism in either bile or intestinal contents.

One conclusion may tentatively be drawn from the findings of this investigation.

Since cattle can acquire inapparent infections of the liver with *Cl. hemolyticum* and since these infections persist in the face of immunity either naturally or artificially acquired, it seems unlikely that *Cl. hemolyticum* can be eradicated from any group of animals in which it establishes a herd infection.

SUMMARY

Clostridium hemolyticum was isolated on four occasions from the livers of apparently normal cattle selected from herds in which bacillary hemoglobinuria had recently occurred. It was also isolated on one occasion from the kidney.

This organism was also recovered from the liver of 1 of 15 apparently normal cattle from a ranch on which the disease had not appeared for five years.

References

[1]Records, Edward, and Vawter, L. R.: Bacillary Hemoglobinuria of Cattle and Sheep (Red Water Disease). Univ. of Nevada, Agric. Exper. Sta. Bull. 173, 1945.

[2]Safford, J. W., and Smith, Louis DS.: A Study of the Epizootiology of Bacillary Hemoglobinuria. Proc. Book, AVMA (1954): 159-161.

[3]Jasmin, A. M.: Enzyme Activity in *Clostridium Hemolyticum* Toxin. Am. J. Vet. Res., *8*, (1947): 289-293.

Polyvalent Aftosa Vaccines

A strong immunity resulted from vaccination of adult cattle with a divalent vaccine containing A_5 and C types of foot-and-mouth disease (aftosa) virus. The immunity lasted more than 14 months in cows, about ten months in heifers, and six months in calves. A tetravalent vaccine produced immunity for all four types of virus but only for a short period.—*Vet. Bull., May, 1956.*

Polyethylene Bags for Liquid Cream.—A new gadget for handling cream is a 5-qt. polyethylene sack which is filled directly from the separator, tied with wire, and kept in the refrigerator until taken to the creamery. Special cartons which hold four bags weigh about 40 lb. when filled.—*du Pont Agric. News Letter, June, 1956.*

Banded animals—land, air, or water varieties—when found should be reported to the Fish and Wildlife Service, Washington 25, D.C.—*Sci. News Letter, April 28, 1956.*

Necrotic Vulvitis in Feedlot Heifers

R. E. PIERSON, D.V.M., and H. J. HILL, D.V.M.

Fort Collins, Colorado

An explosive outbreak of necrotic vulvitis in feedlot heifers was observed recently in northern Colorado. Unlike most reports in the literature, this disease did not involve the anus. The history is unique in that the lesions closely followed experimental administration of estrogenic substances as abortifacients. Whether this may have had some bearing on the development of the disease is purely speculative.

REVIEW OF LITERATURE

Various types of ulcerative vulvitis or anovulvitis of cattle have been recorded. An external ulcerative vulvitis involving 56 of 80 feedlot heifers was reported by Quin in 1921.[1] The lesions ranged from simple ulcers to complete destruction of the external genitalia. While *Spherophorus necrophorus* (*Actinomyces necrophorus*) was considered the primary etiological factor, it was suggested that it might have been a secondary invader, while some unknown pathogen was the primary cause. Predisposing factors included cold, muddy lots; laceration of the vulva by hog bites; and the tendency of heifers to lick the already affected parts of diseased animals.

Little[2] described an anovulvitis-like disease in 1932, which affected some bulls as well as cows. The lesions in the cows were on the vulva, vagina, and even the rectum. Fissures of the rectum were common. A pure culture of a gram-negative bacillus was isolated from each animal and this was thought to be the primary cause. It was also suggested that the primary trouble might have been malicious in nature.

Kinsley[3] reported anovulvitis as one of a group of conditions caused by *S. necrophorus*. He gave credit to Fincher of Kansas as the first to identify this condition. The disease was reported as occurring in 1898, 1905, 1926, and 1929. Cattle of all ages were involved. Sometimes, the feet were affected. All 115 heifers of one group were affected with anovulvitis in various stages of development. Four other lots of cattle were in close proximity; a high incidence of the infection occurred in one lot while, in the other three, there were no cases. Hogs followed the cattle in both the affected and nonaffected groups.

Parker[4] (1898, 1899) described an infectious disease of the vulva in heifers which was characterized by the formation and rupture of pustules. Ulcers formed which had a tendency to slough

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Fig. 1—Necrotic vulvitis of a heifer in the acute stage.

extensively and discharge a sanguineous fluid. In one outbreak, both cows and steers were affected. On the latter, the ulcers were located above the ischial tuberosities and were similar to the ulcerations of the females. The organism isolated from one group resembled *Bacillus typhosus*.

Anovulvitis involving two separate herds, within a period of ten days, was reported by Chapman.[5] The lesions began with a swollen, red, ventral commissure of the vulva. In a day or so, a small scab appeared. When this scab was removed, it revealed a foul-smelling ulcer covered with a tenacious, yellowish exudate. The surrounding tissue was hyperemic and, as the disease progressed, the entire vulva and part of the anus often became affected, accompanied by sloughing.

Fig. 2—Necrotic vulvitis, with lesions, in a heifer.

CASE REPORT

The lesions in this outbreak were confined to the vulva. It involved 57 feedlot heifers which had been examined, *per rectum*, for pregnancy on Dec. 13, 1955. They had been in the feedlot for one month, following grazing on beet-top pasture. Of the 57 heifers, 70 per cent were found to be pregnant and either repositol stilbestrol (Pitman-Moore) or ECP® (Upjohn) was given as an abortifacient. Approximately 35 pigs of various ages mingled with the cattle.

Eleven days following pregnancy examination and administration of the abortifacients (Dec. 24), the owner reported that all the pregnant heifers had developed a violent reaction and that the vulvas of all the treated heifers were "rotten and swollen."

Examination of the heifers revealed swelling and necrosis of the vulva (fig. 1). The lesions varied from small areas of necrosis of the ventral commissure to necrosis of the labia, clitoris, and extending to the urethral orifice. Some lesions showed laceration in the area of necrosis. All were affected, even the untreated, nonpregnant heifers.

An examination of dairy heifers in a nearby lot revealed mild necrotic lesions of the ventral commissure of the vulva. Different pigs had access to this lot.

A group of the heifers was treated when the condition was first diagnosed. Sulfonamide-urea powder was used topically and sulfathiazole systemically.

Three days later, the heifers were again examined. Many of them showed more severe lesions and a few showed necrosis of the entire labia. They did not go off feed, but showed some discomfort while urinating. Temperatures increased to 104 to 105 F. in most animals. Sulfapyridine was given orally and sulfonamide-urea powder topically. Some with more severe cases were also given penicillin. The pigs were segregated from the heifers.

A week later, all heifers were again examined. The lesions were healing (fig. 2) and only a few required treatment.

Two affected heifers were taken to the

Veterinary Clinic for closer observation and for animal-inoculation experiments. None of the inoculated animals developed lesions, suggesting that this probably was not an infectious disease. While not proved, it was concluded that the condition resulted from pigs biting the vulvas of the reclining heifers and that *S. necrophorus* and other contaminating organisms invaded the lacerated wounds.

SUMMARY

An unusual outbreak of necrotic vulvitis has been reported. It occurred 11 days following examinations for pregnancy and the administration of estrogens as an abortifacient. The attack involved practically all of the animals, treated or untreated. Lacerations of the region by hogs and subsequent bacterial contamination are suspected of being the primary cause. Recovery was satisfactory after the hogs were segregated from the cattle.

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Anovulvitis in Heifers

On Dec. 26, 1950, about 95 per cent of a group of heifers (perhaps 150 head), in a feedlot in Iowa, were noticed to be affected with a vulvitis. Lesions varied from small ulcers or exuberant granulations to an ulceration of the entire vulva and lower segment of the anus (2 animals).

The first lesions had been noticed about three days previously. There was some hemorrhage, probably the result of biting by swine.

Three of the most seriously affected heifers (550 lb. each) were confined. Their temperatures were 103 to 105 F. One was given penicillin, the other 2—sulfonamides. In 24 hours, all 3 showed general improvement with temperatures of 101 to 102. By the second day, at least 98 per cent of the heifers were affected. A few more were treated but those first affected seemed to be improving without treatment. Eventually, the condition disappeared without serious sequelae.—W.A.A.

Transmission of Ovine Brucellosis

Rams, in New Zealand, acquired infection with the ovine Brucella-like organism (isolated in 1953) from contact with infected rams and from serving ewes previously served by infected rams. Ewes did not transmit infection to their lambs. Ewes were susceptible to oral infection during early pregnancy but those in their first pregnancy lambed normally. Ewes appeared resistant to natural infection.—*Vet. Bull., May, 1956.*

Repeated Injections of Tuberculin

In diagnosing avian tuberculosis, a triple intradermal tuberculin test, with injections repeated in 48 and 72 hours, detected two to four times as many infected chickens as the single injection test. Infected pullets, 6 to 8 months old, usually did not react to either a single or triple test. Tests in over 8,000 birds were confirmed by necropsy.—*Vet. Bull., May, 1956.*

An Intradermal Test for *Corynebacterium Equi* Infection in Horses

When 38 brood mares and 15 other horses in Australia were injected intradermally with 0.1 ml. of a culture of *Corynebacterium equi* recovered from an abscess in a foal, positive reactions in mares appeared to be associated with production of infected foals or with barrenness. The disease usually infected foals when 1 to 6 months old, often causing death in one to two weeks.—*Austral. Vet. J., July, 1955.*

Myxomatosis virus may survive for ten months in dried rabbit skins. For industrial use, the dried skins are effectively disinfected by heating to 70 C. for five hours.—*Vet. Bull., May, 1956.*

Nitrofurazone for Pig Paratyphoid.—Nitrofurazone, in a concentration of 0.05 per cent of dry pig meal, when fed to swine of various ages, which were showing unthriftiness, diarrhea, and the roughened skin typical of paratyphoid infection, usually resulted in marked improvement in five to 14 days.—*Vet. Rec., May 5, 1956.*

Monieziosis in a Wisconsin Lamb

W. C. CAMPBELL, M.S.; A. C. TODD, Ph.D.; D. D. COX, M.S.; A. F. KROHN, D.V.M.

Madison, Wisconsin

In July, 1955, a lamb raised in Dodge County, Wis., was found to harbor a total of 251 tapeworms (*Moniezia expansa*). The lamb was 1 of a flock of 135, of which 6 had died within a period of two weeks. According to the owner, "the lambs lost control of their legs and went around in circles two or three hours before dying." Diarrhea and anorexia were not reported. The lamb was 3 to 4 months old and was unweaned. It had been treated twice for tapeworms, once (June 2, 1955) with lead arsenate and once (June 25, 1955) with a commercial preparation, taeniatol.* It had failed to respond to these treatments and was moribund when slaughtered for necropsy on July 5, 1955.

The small intestine was found to contain tapeworms so numerous that they formed a thick "rope," almost completely occluding the intestine. The worms were dead but, with one or two exceptions, did not show signs of degeneration. The scolices of the tapeworms had become detached from the intestinal lining and a count of the individual worms could be made by separating and counting the scolices. The greatest length of strobila present was not recorded, but many were 3 to 4 ft. long and some sections were 9 mm. wide (fixed but unmounted). There were also many worms which measured only 2 to 3 inches in length. This disparity in the worm sizes may reflect the findings of Kates and Goldberg[1] who reported that growth is "irregularly retarded" when large numbers of tapeworms are present. Microscopic examination of many strobilae revealed the rosette type of interproglottid glands characteristic of *M. expansa*. No strobila was identified as *Moniezia benedeni*, but not all were examined for specific identification. It was observed that many of the strobilae contained malformed or "anomalous" proglottids.

These observations may demonstrate that, even though an anthelmintic effectively kills Moniezia, failure to expel the worms from the intestine may well prove fatal in heavy infections. Secondly, the number of tapeworms present in the lamb, while not the largest ever reported, is nevertheless unusual enough to seem worthy of record. Curtice[2] stated that "it is unusual to find more than a half-dozen adults together." Porter[3] reported on 144 scattered Moniezia infections of cattle and sheep from which a total of 669 tapeworms was collected, giving an average of 4.7 worms per animal. On the other hand, the literature contains many references to "heavy infections" and "numerous tapeworms" but actual worm counts are generally omitted; Lafenetre[4] reported "massive" infections of 6 to 10 tapeworms in sheep. The highest number of tapeworms so far reported from 1 sheep is 336 (Morgan[5]). The present report of 251 worms seems to be the second highest on record.

A scolex count, however, is not in itself a good indication of the severity of an infection. Eveleth and Goldsby[6] suggested using the number of grams of tapeworms per pound of body weight as an expression of tapeworm infection, while Kates and Goldberg[1] submitted that the volume of tapeworms was a more reliable criterion than the number of scolices. The total volume of tapeworms in the present case was 175 cc. as determined by displacement of liquid. The greatest volume recorded by Kates and Goldberg was 160 cc. which represented 75 tapeworms. The present report, therefore, supports the contention of these authors that the actual scolex count accurate quantitative picture of the infection in individual animals.

The Wisconsin Animal Disease Diagnostic Laboratory, to which the lamb in question had been submitted, found no evidence of other causes for the lamb's comatose condition and recorded a diagnosis of "severe parasitism (tapeworms)." The record mentions "very few" stomach worms and cecal worms. Among the mass of tapeworm material collected from the small intestine, 3 proglottids of *Thysanosoma actinioides* were found, indicating a fringed tapeworm infection.

The present case history seems to sup-

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Paper N.S. 204, published with the approval of the director of the Wisconsin Agricultural Experiment Station and supported in part by the Research Committee of the Graduate School with funds from the Wisconsin Alumni Research Foundation, and in part by Pittman-Robertson project (W-15-R) of the Wisconsin Conservation Department.

*The active ingredient of taeniatol (Pitman-Moore Co., Indianapolis) is 2,2"-dihydroxy-5,5'-dichlorodiphenylmethane.

port Monnig's opinion (cited by Kates and Goldberg[1]) that young lambs before weaning show the most serious effects of heavy tapeworm infection, and it is reported in view of the widely divergent opinions which have been expressed concerning the pathogenicity of *M. expansa*.

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Onion Poisoning in Cattle

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Onions are one of the crops produced in the irrigated land of the lower Snake River Valley (Idaho-Oregon). Depending on fluctuations in market price and produce quality, considerable quantities of onions are either discarded in disposal areas or deliberately fed to livestock which will eat them both fresh and decayed.

Sheep especially relish them and are commonly maintained on onions alone for periods of weeks or months. No losses in sheep attributable to such rations have been observed, but owners have occasionally reported transient, bloody urine.

The literature contains records of onion poisoning. Goldsmith,[1] in 1909, reported onion poisoning in cattle. In 1939, Thorp and Harshfield[2] reviewed the literature which included instances of poisoning in cattle and horses and they described the loss of 9 horses which had access to onions. However, livestock people seem generally unaware of the hazard.

Over a period of 12 years, numerous instances have been observed where cattle have sickened and died after consuming onions ranging from fresh to decomposed. Symptoms may appear as early as the sixth day of onion feeding. Younger animals appear most resistant. Hemoglobinuria, anemia, and icterus are constant signs of this poisoning, with a remarkably prompt recovery after a change to proper feeds. Symptomatic treatment has appeared beneficial, if it can be administered without excitement. Sudden death may result from restraint. Owners report occasional cases of sloughing of tails and feet in recovered animals which have developed anemia.

In March, 1946, a rancher near the Snake River in Idaho made an urgent call for help. He had started to drive about 50 head of Hereford cows a distance of 1 mile from a pasture in which he had found a dead heifer. After a few minutes, some of the poorer cows fell behind and 3 collapsed and died before the drive was stopped. Several more appeared dangerously ill. Necropsy revealed extreme anemia. Tallqvist readings were below the lower limits of the scale. Blackened material adhering to the muzzles of the cattle led to the discovery that they had been feeding on the crusted residue of onions that had been dumped in previous years, having first consumed those discarded the current year. No more losses occurred after the herd was removed from the onions.

Samples were collected and submitted to a laboratory.* Examinations for heavy metals and prussic acid were negative, as were bacteriological cultures. Chemical tests indicated that the toxin was an alkaloid which on both intramuscular and intraperitoneal injection in mice and guinea pigs resulted in immediate death.

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*Dr. F. X. McArthur, Livestock Disease Control Laboratory, Boise, Idaho.

Sunburn from Snow-Reflected Rays.—All of the Holstein-Friesian cows in a herd of 6 developed sunburn of their white udders during a clear day late in April when the sun's rays were reflected from the snow-covered field. Since the cows had previously had access to little green feed, photosensitization could scarcely have been a factor.—W.A.A.

Leptospirosis in the Field

A field survey of leptospirosis in swine, in Australia, revealed: that almost invariably abortions and neonatal losses in a herd followed introduction of new breeding animals; in many herds, all pigs were born dead or died within 24 hours, while in others, 50 per cent survived; in only two herds did sows abort twice in successive pregnancies—in all other herds most of the sows carried their next litters normally; a few sows failed to conceive after aborting.

As in bovine brucellosis, following an "abortion storm," abortions occurred only in maiden sows or those newly added to the herd.—*Austral. Vet. J., Jan., 1956.*

Clostridium Welchii, Type C, Infection in Young Pigs

Losses of 70 per cent of newborn pigs from a necrotic type of enteritis occurred in some herds in Hungary. Most deaths occurred at 3 to 6 days of age, with a few after 2 weeks of age. The intestinal wall was emphysematous and congested, with necrotic lesions in the jejunal mucosa. Toxin of *Clostridium welchii*, type C, was isolated from the intestines of the pigs and from the feces of their dams.

The disease was reproduced by oral administration of cultures of the isolated organisms.—*Vet. Bull., May, 1956.*

Notes on Swine Erysipelas

Swine erysipelas is infectious but not highly contagious. Pigs may have temperatures of 105 to 109 F. and still appear normal. It is doubtful if visibly sick animals completely recover without treatment; many later develop enlarged joints or valvular endocarditis. Chronic cases probably have started as the acute type. In some infected herds, characteristic skin lesions, resembling bumblebee stings, may be found on the backs of a small percentage of the affected pigs.

When procaine penicillin (3,000 units/lb.) in oil is given with erysipelas serum, results are much better than with serum alone. Pigs so sick they are helpless are often eating normally within 24 hours. If treated while temperatures are near the peak, probably 85 to 90 per cent make complete recoveries.

Prior to 1931, acute erysipelas may have been misdiagnosed as hog cholera and probably still is. However, there is no greater mistake than to diagnose hog cholera as erysipelas. I have seen acute erysipelas ten days after simultaneous vaccination for hog cholera, but such a diagnosis should not be made unless confirmed by a laboratory. Apparently, the older the pigs when vaccinated, the longer the immunity but they should be inoculated before infected. The dosage I used is: for pigs under 75 lb.—3.0 to 5.0 cc. of serum and 0.5 cc. of culture; 75 to 100 lb.—5.0 to 7.0 cc. of serum, 0.75 cc. of culture; over 100 lb.—10.0 to 20.0 cc. of serum and 1.0 cc. of culture.—*L. T. Railsback, D.V.M., Vet. Sci. News (Univ. Wis.), Spring, 1956.*

Brucella Suis Infection in Hares

Four enzootics of brucellosis in swine appeared and were eliminated in Denmark from 1929 to 1955. Wild hares were believed to be carriers since strains of *Brucella suis* pathogenic for swine have been recovered from them.

During 1954, 35 of 613 hares examined gave positive serological reactions and 16 of the 35 yielded cultures of *Br. suis*. The organs most frequently affected in hares were the testicles, uterus, mammary glands, and spleen. Other organs were occasionally infected. The lesions were flattened, discrete nodules containing firm pus or caseous necrotic tissue, which might be confused with *Pasteurella pseudotuberculosis* or *Staphylococcus pyogenes* infections.—*Vet. Bull., May, 1956.*

Swine fed trichloroethylene-extracted soybean oil meal which was highly toxic to cattle, at a level of 10 to 20 per cent of the ration through two generations, showed no toxic effects.—*J. Anim. Sci., May, 1956.*

Summer Sores in Horses.—For a number of years, summer sores (dermatitis granulosa) in horses have been relieved by removing the animals from the ammoniacal atmosphere of the stables.—*Nord. Vet.-med., April, 1956.*

The panda, one of the rarest of animals, has a face like a raccoon, feet like a cat, and a body like a bear.—*Sci. News Letter, May 5, 1956.*

What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue of the JOURNAL.

Make your diagnosis from the picture below—then turn the page ▶

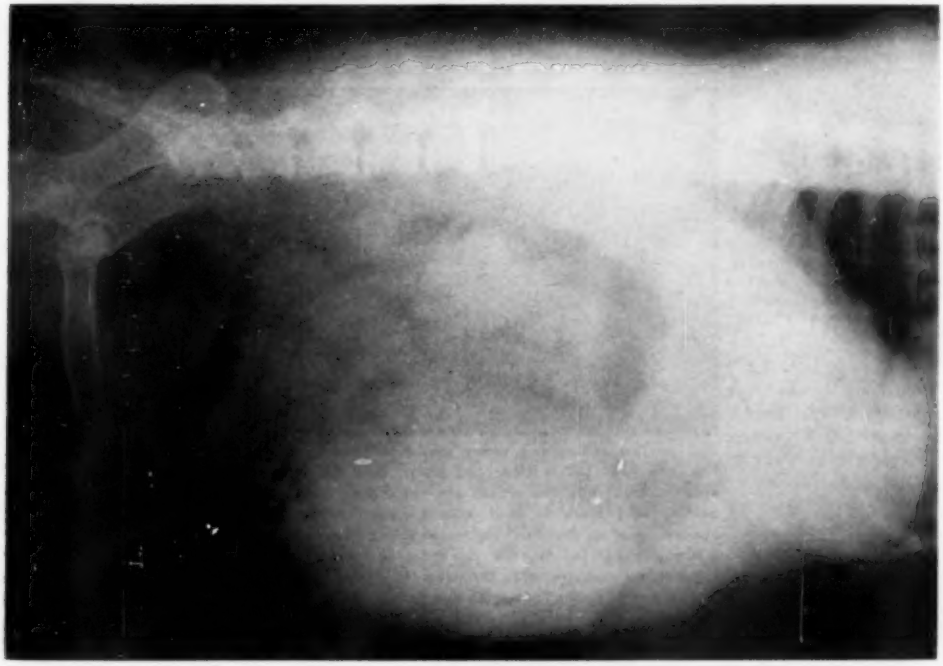

Figure 1

History.—A spayed Scottish Terrier, 10 years old, appeared to be in good health and ate her morning meal with vigor. One hour later, she suddenly became listless and weak in the hindlegs. When examined two hours after the onset of illness, she showed extreme anemia, a pendulant abdomen, a rapid and weak pulse, extreme depression, and had a temperature of 101 F. A mass could be palpated in the abdomen. The radiograph shown here was taken and the dog was prepared for surgery.

(Diagnosis and findings are reported on the next page)

Here Is the Diagnosis

(Continued from preceding page)

Editor's Comment.—Splenic tumors are not uncommon in middle-aged or old dogs, and acute hemorrhage from such a lesion should be considered when making a diagnosis in a patient with acute shock and sudden anemia.

Diagnosis.—The diagnosis was shock resulting from acute hemorrhage into the peritoneal cavity caused by a rupture of a cavernous hemangioma (15-cm. diameter) of the spleen.

Laparotomy, splenectomy, and transfusions of whole blood restored the health of the animal and she was discharged from the hospital in eight days.

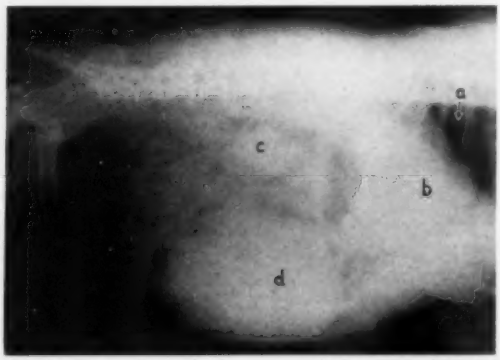

Fig. 2—This radiograph shows several diagnostic features. The lung field (a) is clear and sharp while the abdominal area is cloudy and the organs are not sharply defined, suggesting that there is fluid in the cavity. In the cloudy abdominal area, the liver (b), probably a kidney (c), and a dense mass (d) on the abdominal floor can be seen. Laparotomy revealed that the mass (d) was the tumorous spleen and the cloudiness was due to the dispersed hemorrhage.

This case report was submitted by Dr. William E. Roy, Rowley Memorial Animal Hospital, Springfield, Mass.

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

Isolation of Newcastle Disease Virus from Man with Confirmation by Electron Microscopy

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NEWCASTLE DISEASE is one of the most important conditions affecting poultry throughout the world. It was recognized in chickens in the United States in 1941, and a few cases of Newcastle disease virus have been reported in man.

CLINICAL ABSTRACT AND METHODS

Proof of human infection with Newcastle disease virus has been difficult to establish because of poor or no immunogenic response in individuals from whom the virus was isolated. Although chicken embryos have been used to isolate the virus from urine, nasal discharges, saliva, blood cells, and eye washings from people with Newcastle disease,[1-3] little specific data have been presented to show that the virus may be identified directly from the patient's blood and eye washings by cerebral inoculation into hamsters, or to show the virus to be present with or without tails by electron microscopy from the same specimen.

The patient (Chang) had been working with the egg-adapted California strain 11914 of Newcastle virus for some time. On June 4, upon arising, he noticed that there was a crusted exudate in the right eye accompanied by intense pain behind the eye. The conjunctivae were inflamed, with a moderate amount of exudate. Besides the eye, the patient suffered no other discomfort. Blood was collected on June 4 at 10:00 a.m. and placed in sterile heparinized saline solution. Conjunctival washings were also collected with sterile normal physiological saline solution. The same procedure was carried out on June 5. On June 6, the eye infection subsided to a great extent. No other specimens were collected during the course of the disease.

METHODS AND RESULTS

Hamsters, 16 to 18 days old, were inoculated intracerebrally with 0.06 ml. of the patient's blood taken on June 4 and 5. Hamsters injected intracerebrally with the first sample of blood developed Newcastle disease symptoms within four to six days, as usually found in animals injected with egg-adapted Newcastle disease virus (California strain 11914).[4] Hamsters inoculated with the second blood specimen appeared normal throughout a 21-day observation period. Hamsters were injected in the same manner with the conjunctival washings of June 4 and 5. Those receiving inoculum from the first specimen developed typical Newcastle disease symptoms, as did those inoculated with the specimen taken the second day.

Each blood specimen was prepared for

Fig. 1—Electron micrographs of erythrocytes in blood taken from patient on June 4. Virus with and without tails are indicated by arrows. Shadowed with chromium at arc tangent 2/12; x 30,000.

TABLE 1—Response of the Syrian Hamster Inoculated Intracerebrally with Blood and Eye Washings from Patient (Chang)

Time interval	Specimen	No. hamsters injected	No. hamsters showing symptoms	Neutralization
June 4	Blood	6	6	Confirmed to be NDV.*
June 4	Eye washings	6	6	Confirmed to be NDV.
June 5	Blood	6	0	
June 5	Eye washings	6	6	Confirmed to be NDV.

*NDV = Newcastle disease virus.

From the Virus Laboratory, Live Stock Sanitary Service, University of Maryland, College Park. Professor of virus diseases (Reagan); assistant professor, virology and biochemistry (Chang); virologist (Yancey); director of Live Stock Sanitary Service (Brueckner).

electron microscope examination by placing several drops of the erythrocyte-heparinized saline suspension in distilled water for ten seconds in order to remove hemoglobin so that the electron beam would penetrate the erythrocyte. The specimen was then placed again in saline solution for ten seconds to accentuate the tail form in, on, or around the erythrocyte. This suspension was then placed on parlodion film supports which had been prepared seven days previously. The films were dried and shadowed with chromium[5] at arc tangent 2/12 and examined under the R.C.A. electron microscope, type EMU.

Upon examination of the June 4 specimen, virus-like particles with and without tails were observed in, on, and around the erythrocyte in the majority of erythrocytes examined (fig. 1). No virus-like particles could be seen in the June 5 blood specimen. Blood from several uninfected persons was treated in the same manner and, upon examination, no virus-like particles were found.

Conjunctival washings from June 4 were treated with penicillin (5,000 units per ml.) and streptomycin (250 mg. per ml.) and 0.2 ml. was injected into 10-day-old embryonating chicken eggs. The inoculum was cultured and contained no bacteria. The embryos died within 48 hours and were found to be free of bacteria. Neutralization of the infected allantoic fluid from the first egg passage was conducted in embryonating chicken eggs with immune serum from chickens which had recovered following inoculation with the California strain 11914, and the virus was confirmed to be Newcastle disease virus.

Neutralization tests were also conducted in Syrian hamsters, using immune chicken serum and virus-bearing brain material from the first hamster passage. The virus was confirmed to be Newcastle disease virus.

SUMMARY

A case of conjunctivitis in man, associated with the virus of Newcastle disease, has been described. Blood and conjunctival washings were demonstrated to contain the virus by inoculation into the brains of Syrian hamsters and embryonating chicken eggs. The virus was confirmed as Newcastle virus by neutralization tests in hamsters and embryonating chicken eggs. Electron micrographs revealed the virus particles in, on, and around erythrocytes collected on the day of eye infection.

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Chick Response to Growth Hormones

When chickens less than 4 weeks old were fed or injected with diethylstilbestrol, testosterone, or certain other hormones, their weight gains were not significantly influenced. Growth was actually decreased in baby chicks—more in males than in females.—*Science, Nov., 1955.*

Cormorants Carry Newcastle Disease

The study of an epizootic of Newcastle disease in northwestern Scotland, in 1949 to 1951, implicated the cormorant, a seabird, as the source of infection. Eight to 12 days prior to the illness, cormorants had been killed and fed to 23 of the 26 flocks of chickens investigated. The other three flocks were close to where cormorants congregated.

Of 60 cormorants examined, antibodies to Newcastle disease were found in 40 per cent and the virus was isolated from 10 per cent. A year later, when the disease was no longer present, none of 32 cormorants showed antibodies or virus. The disease did not spread from one flock to another, nor was there evidence of any other source of infection.

Evidence indicates that an extensive epizootic of Newcastle disease occurred in the same area in 1897, 1898, and not again until 1949.—*Canad. J. Comp. Med. and Vet. Sci., May, 1956.*

Q fever apparently exists in 51 countries on five continents.—*Vet. Bull., May, 1956.*

Dental Examination of Show Steers

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The dental examination of steers is commonly referred to as "mouthing." It has been adopted, in the last few years, as a compulsory procedure by several of the largest beef cattle shows in the United States and Canada. The veterinarian who examines the calves at various shows does not determine the age of all animals, he simply interprets the show rules and regulations as regards maximum dental development allowed in the various classes. The following are regulations as they will appear in the premium list book for the 1956 International Livestock Exposition to be held in Chicago in November.

Senior Calf.—The senior calf must have all eight temporary incisor teeth firmly in place. There may be no evidence of eruption of any permanent incisors.

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The author expresses his sincere appreciation to Dr. Leo Mr. Cropsey, Cassopolis, Mich., who has served with him for the past two years on the dental examination committee for the International Livestock Exposition, for help in preparation of this paper; to Professor Edward R. Hauser, beef cattle specialist, University of Wisconsin, for his counsel and data on dentition of beef cattle; to Professor Arlie Mucks, Agricultural Extension, University of Wisconsin, and a member of the board of directors of the International for his encouragement; and to Mr. William E. Ogilvie, Chicago, Ill., secretary-manager, International Livestock Exposition, and his staff for aid and cooperation in making possible the observations herein reported.

Summer Yearling.—A summer yearling must have all eight temporary incisor teeth in place. There may be no evidence of eruption of any permanent incisors.

Junior Yearling.—A junior yearling may have the two center temporary incisor teeth replaced by permanent incisors. The remaining six temporary incisors must be in place and there may be no evidence of eruption of any permanent incisors other than the centers.

While reference is made, in the regulations, only to the incisor teeth, it is possible to include an examination of the molars in the process. However, it is seldom done. Most veterinarians feel that the incisor teeth constitute the most reliable criterion for the determination of age in cattle. By way of review, let us consider a few things that most of us have had no occasion to refer to since we closed Sisson's anatomy book after the first or second year of veterinary school. In calves, two or more incisor teeth are usually showing at birth. The remaining incisors all appear within about one month. They are almost square as one looks down on them and generally become darkened or black before being shed. The incisors are popularly known as "centers," "first intermediates," "second intermediates," and "corners," reading from the median plane. The temporary incisors are usually shed in pairs and replaced by their permanent counterparts in pairs. One may precede the other by a few days or weeks. A temporary in-

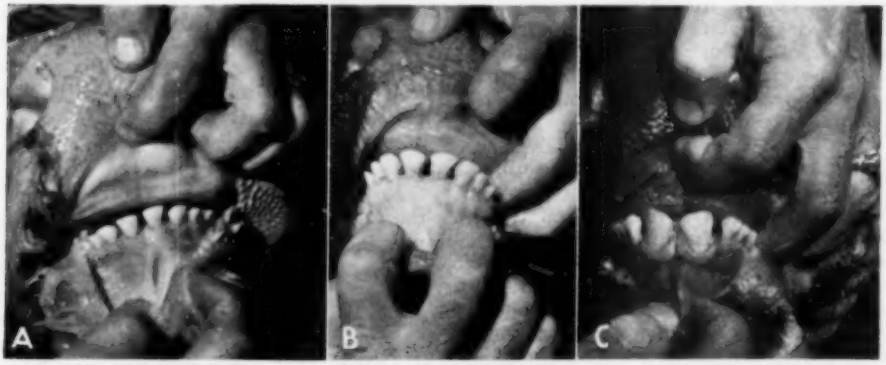


Fig. 1A—A senior calf must have all eight temporary incisor teeth firmly in place with no evidence of eruption of any permanent incisors.

B—A summer yearling must have all eight temporary incisor teeth in place with no evidence of eruption of any permanent incisors.

C—A junior yearling may have the two center permanent incisors but no evidence of eruption of the others. The remaining six temporary incisors must be in place.

cisor may be retained after its permanent incisor replacement has erupted. Eruption, as the name implies, denotes the first appearance of a tooth as it breaks through the gingival mucous membrane. The interval of time from the eruption of a permanent incisor until it is in wear may be as short as 60 days; however, it is usually at least 90 days.

Steer classes, in the shows of today, usually include senior calves, summer yearlings, and junior yearlings as described above. At the time of the International in Chicago in late November, a senior calf may be a maximum of one week less than 15 months of age, a summer yearling one week less than 19 months of age, and a junior yearling one week less than 23 months of age.

TECHNIQUE OF THE EXAMINATION

Proper restraint is imperative in a dental examination of any animal. The ranger cattle chute is ideal for this purpose. If only a few of the animals are to be examined, the veterinarian can easily handle their heads himself but, if there are a thousand animals as there were in the 1955 International, it is desirable to have a helper to control and raise the animals' heads. The veterinarian then observes the teeth of each animal using his fingers as well as his eyes. The mucous membrane posterior to the incisors should be palpated to insure that no permanent incisors are erupting. Since the dental formula for a senior calf is the same as for a summer yearling, the firmness of the temporary incisors must be considered. Firmness, of course, is a relative term, but the teeth in a senior calf should not be so loose that it is possible to wiggle them, whereas in a summer yearling the temporary incisor teeth may be quite loose.

The trend is for more beef cattle shows, both large and small, to incorporate a mouthing examination in their regulations. Veterinarians will be called upon to help with the formulation of regulations as well as for the examination of the steers. We believe that the International regulations are fair and realistic and may be taken as a guide. It must be understood, of course, that shows earlier in the year would require a tightening of these regulations, whereas later shows would have to allow for a bit more advanced dental development.

In the 1955 International, it was necessary to reclassify only about 7 per cent of the animals following a dental examination. About ¾ of these steers were summer yearlings which had to be reclassified as junior yearlings. The remainder were senior calves which were reclassified as summer yearlings. Of nearly 1,000 steers presented, it was necessary to completely eliminate only 5 animals. All of these had either three or four permanent incisor teeth in place. No difference was found in the dental development of the various beef breeds. It is our opinion that the vast majority of necessary reclassifications are honest mistakes on the part of the exhibitor. Many of these calves are born on the range and their exact age is not known. They may be appreciably older than the breeder or exhibitor thinks they are.

It is gratifying to see the evenness of the classes after this examination. Show officials and exhibitors often remark about this.

No one is infallible and anything is possible in dealing with animal life. However, if the veterinarian does a thorough, conscientious job, everyone concerned should be pleased and no one will be unduly penalized.

Psittacosis

A woman who worked in a pet shop in Maine developed psittacosis—confirmed by complement-fixation test. Seven newly purchased birds had died in the shop two months previously.

Confirmed cases of psittacosis were also reported in one person in Ohio, three persons in Minnesota, one in Washington, and one in Texas. All had contact with parakeets.—*Pub. Health Serv., April 28 and May 5, 1956.*

Brucellosis Control in Switzerland.—In the Canton of Zurich, when the milk ring test indicates brucellosis in a herd, cows which are excreting organisms in the milk or from the uterus are slaughtered. Their owners are compensated up to 80 per cent of market value, provided sanitary regulations are followed and heifers are vaccinated with *Br. abortus*, strain 19, between the ages of 6 and 12 months.—*Vet. Bull., April, 1956.*

An Intradermal Test for Brucellosis

The intradermal brucellin test was compared with serological tests in Hungary. In apparently normal herds, negative serologically, 8.5 per cent of the cattle reacted to the brucellin test. In infected herds, there were from 1.6 to 18.5 per cent more positive reactions with brucellin. In animals vaccinated six months previously with strain 19, all reacted to brucellin while only 64.7 per cent reacted to serological tests.—*Vet. Bull., May, 1956.*

Treatment for *Oestrus Ovis* Larvae

Since the fly which deposits *Oestrus ovis* larvae in the nasal passages of sheep does no feeding, its elimination or control is difficult. A new method, introducing lindane (4 Gm. per 100 cc. of an emulsifying solvent) into each nasal passage while the animal is held on its back and the head is at a 45-degree angle with the ground, has proved efficient and is well tolerated. Since reinfection is to be expected, the dose (4 cc.) should be administered at least three times at three- to four-week intervals during the fly season.—*Onderstepoort J. Vet. Res., Jan., 1956.*

Stratification in the Bovine Rumen

Hourly observations of 3 steers with rumen fistulas, for 12 hours including two feeding periods, indicated that hay and grain particles move independently in the rumen. Coarse hay particles collect in a mat at the top, while grain particles rapidly settle. The activity of microorganisms creates gas in the hay particles which makes them buoyant. When this activity decreases, the digested roughage particles settle. The higher nitrogen values in the top ingesta suggests that microorganisms may be in greater concentration there.—*J. Dai. Sci., May, 1956.*

"Black Disease" in a Heifer

"Black disease" (infectious necrotic hepatitis) due to *Clostridium oedematiens* (*Cl. novyi*) is reported, in Wales, in a heifer for the first time. In recent years, it has become the chief cause of losses in adult sheep in that area. They usually die in a few hours but the heifer was ill for four days. The chief lesion revealed at necropsy was a pale, yellowish white area of necrotic tissue in the caudate lobe of the liver; numerous flukes were also present. Bacterial cultures from this lesion produced organisms indistinguishable microscopically from *Cl. oedematiens.*—*Vet. Rec., April 21, 1956.*

Feline Enteritis in Wild Felidae

Three young lynx and a young cheetah developed feline enteritis (panleukopenia) three months after the latest possible outside exposure and about four months after a young lynx had died with this disease on the same premises. Fomites from the latter animal were considered the source of the infection. Two kittens inoculated subcutaneously with spleen material from the cheetah developed typical illness and died in four and eight days, respectively.—*Brit. Vet. J., Oct., 1955.*

[This report would seem to justify the method recommended for eliminating the disease from farms prior to development of the serum and vaccine, namely to destroy all baby kittens and to keep new cats off the premises for at least a year after the last probable infection.]—W.A.A.

Sulfates Stimulate Chick Growth

When sodium sulfate (0.5%) was added to a purified ration for chickens, it increased the growth rate if the trace elements were in the form of oxides or chlorides but not if these elements were in the form of sulfates. Sulfates also seemed to stimulate normal feather growth.—*Science, Dec., 1955.*

Activity of Antibiotics on PPLO.—Chicken embryo and *in vitro* tests, on the activity of various agents against several strains of pleuropneumonia-like organisms (PPLO) pathogenic for mammals, indicated that oxytetracycline (terramycin®), the other tetracyclines, and erythromycin were usually the most effective.—*Cornell Vet., April, 1956.*

Pasteurella gallinarum is proposed as the name for a new species of Pasteurella isolated from birds with fowl cholera.—*Vet. Bull., April, 1956.*

Nutrition

Fluorine in Mineral Mixtures

Fluorine in appreciable amounts is present in all natural phosphorus-containing minerals, so use of the latter must be limited. The maximum of fluorine in a mineral mixture should not exceed the following percentages: 0.3 for cattle; 0.35 for sheep; 0.45 for swine; and 0.6 for poultry.

Rock phosphate which contains 13 per cent phosphorus and 2 to 4 per cent fluorine should be used for not over 1 per cent of a poultry mash and considerably less for the other animals.—*Feed Bag Red Book, 1956.*

Sodium Fluoride in Turkey Feed.—A fluoride equivalent of 100 p.p.m. in the ration of turkeys, 10 to 12 weeks old, did not affect their growth, but 200 p.p.m. decreased weight gains. A level of 1,600 p.p.m. was tolerated for four to six weeks. —*Poult. Sci., Nov., 1955.*

Protein Ration and Reproduction

A low-protein ration for cows was associated, at Beltsville, Md., with a longer interval between calves and a shorter period of estrus. The weight of calves at birth was not significantly different but, at 6 months of age, they averaged 40 lb. or more less than calves from the control cows. The control group was fed 0.9 lb. of digestible protein per head daily; the low-protein group, 0.6 lb. (the latter is probably more than many cattle receive).

With vitamin A deficiency, results were more positive. On a daily *beta* carotene allowance of 30 μg. per kilogram of body weight, calves were rarely born alive and none lived to weaning age. On 90 μg. per kilogram, calf production was satisfactory; but for best results, 120 μg. is recommended.—*Agric. Res., April, 1956.*

Vitamin A and Keratoconjunctivitis.—Of a flock of 100 sheep maintained on a vitamin A-deficient ration for two months, 50 developed signs of ocular inefficiency within a week. Bacteriologically, a mixed flora of low pathogenicity was revealed. The condition responded to oral administration of vitamin A and an improved ration.—*Vet. Bull., March, 1956.*

Vitamin C and Bloody Milk.—When blood suddenly appeared in the milk of a herd of 61 apparently healthy cows, the condition disappeared after a single intramuscular dose of 10 ml. of 5 per cent ascorbic acid to each cow.—*Vet. Bull., March, 1956.*

Vitamin B_{12} Deficiency in Vegetarians

A definite illness which may appear in persons who have been true vegetarians for several years can be alleviated by administration of vitamin B_{12}. The most common symptoms are a sore tongue and nonspecific nervous symptoms. The vitamin B_{12} serum levels in this group range from 45 to 193 μg. per milliliter compared with 200 to 300 μg. in those on a part-protein diet.—*Nutr. Rev., March, 1956.*

Horse Pasture Improvements

Kentucky bluegrass may be replaced as a pasture grass for horses because it grows during such a short season in northeastern states. Of 35 grasses and clovers being tested in a research project at Rutgers University, alta fescue seems to best fit the needs for horses but some horses may have to learn like it.

The pasture needs of horses and cattle are not the same. The need of horses for the plant compound, phytin, and its relation to bone development is also being studied.—*Rutgers Univ. Release, March 7, 1956.*

Calcium Depletion in Laying Hens

Pullets were maintained on a high (1.9 %) calcium diet until they laid their third egg. Then they were placed on a low (0.26 %) level. The eggs, droppings, and skeletons of the birds were analyzed for calcium and phosphorus.

On the deficient diet, skeletal losses of calcium were 16.3, 25.2, and 38.4 per cent after laying two, four, and six eggs, respectively.

Percentage losses of phosphorus were slightly less. The losses were greatest in the ribs, sternum, ilium, ischium, pubis, coccygeal vertebrae, and fibula (over 50%) and least in the skull, metatarsus, and phalanges.—*World's Poult. Sci. J., Jan., 1956.*

A Briton Views Veterinary Education in North America

During 1955, Dean J. B. Polding, of the School of Veterinary Science at Makerere College in Kenya, visited a number of veterinary schools on this continent and his impressions, reported in *The Veterinary Record* (April 7 and 14, 1956), should be of interest to all in the profession.

It is always intriguing "to see oursels as others see us," and the keen analysis by Dr. Polding is thought-provoking. It includes logical analytical comparisons of veterinary education here and in Britain.

He credits the Council on Education of the AVMA with "creation of an admirable uniformity of standards among the schools." He has a word of praise for the regional plans of operation (the 13 southern states and the 10 northwestern states).

Dr. Polding remarks that facilities of the schools vary "between the perfectly adequate, although . . . in part makeshift, to the luxurious. . . ." However, he questions the need for duplicate "auditoria" and classrooms which, with other facilities, provide in one school 250 sq. ft. of floor space per student. The modern equipment and "ample room for research, routine diagnosis, and housing of extension staff" are commended.

As principal advantages of American schools, he mentions regulations permitting the "free use of experimental mammals by students"; also the "extensive field of clinical work available to students," the result of having "the schools in small university towns in intensely agricultural areas." This makes possible the use of "up to four fully equipped ambulatory clinic cars per school," for "day-and-night call in large animal practice. Not only does this system teach students the realities of practice, but it attracts . . . more clients" to the clinics; and it provides more "postmortem and clinical pathological material."

Dean Polding wonders whether this system, with its "reduction of time available for pure study and thought, is better than the English system where pregraduate practice is seen mostly during vacation" with practitioners.

He questions the value of some of the "frequent attendance" of staff members "at conferences, symposia, . . . and seminars," but suggests that they may have "hidden value not obvious to the visitor."

With regard to students, he observes that "from a tender age 'Junior' is encouraged to help himself . . . [and since] technical ability is held pre-eminent . . . is reared against a background of mechanical hobbies and toys." He observes that, later, in addition to their "capacity for hard work, final year students are singular for their self-confidence and technical forwardness," which enables them to do clinical work with little supervision.

The dean comments that the teaching method, which is "achieved largely through student recitations, differs from that in the United Kingdom in [being] intensely practical" and, consequently, it instills great technical ability. However, "only at postgraduate level . . . are students given the opportunity and encouragement to become imaginative, constructive thinkers."

Regarding conferences on sick animals, where the students give their observations along with staff members and visitors, "all of whom are equally in the dark," his reaction was that this "admirable . . . system is in the reverse direction from the orthodox; the student . . . works backward from what he can see, when he has learned to see it, to what he may have been told or read . . . [as] he will have to do in afterlife."

Dr. Polding is of the opinion that sole reliance on the weekly grading system is a serious weakness; it keeps the student on his toes but tends to cover only the previous week's work; thus, a student might do well without fully appreciating the entire subject. He also detected "a tendency . . . to conduct these tests in the form of groups of . . . statements . . . with a request to tick one, [which] must be incredibly easy." However, without a "searching examination at the end of the year, the obligation to . . . appreciate the whole subject does not exist . . . and . . . permanent knowledge is never examined." As to the argument "that the state board examination takes care of . . . this," he states that "it is surely anomalous for the D.V.M. to be awarded before the key examination."

He commends "the effort of the AVMA to introduce country-wide standard state examinations with central examiners" as being "praiseworthy and overdue." He "believes that the American system would gain . . . if the grading system were retained but had superimposed on it the formal yearly examination with external examiners, as used in Britain."

Current Literature

ABSTRACTS

Differentiation of Equine Abortion Virus

Anti-abortion virus serum did not neutralize infectivity for chicken embryos or inhibit agglutination of chicken red blood cells by influenza viruses A, B, C, and Shope-15, the infant pneumonitis virus; mumps virus; or Newcastle disease virus. Antiserums for mumps, Newcastle disease, and influenza viruses did not neutralize infectivity of hamster-adapted abortion virus. Hamsters immunized against the mumps, Newcastle disease, and influenza viruses were not protected against the abortion virus.—[*E. R. Doll, William H. McCollum, John T. Bryans, and Elizabeth W. Crowe: Serological Differentiation of the Equine Abortion Virus from the Human and Swine Influenza, Mumps, and Newcastle Disease Viruses. Am. J. Vet. Res., 17, (April, 1956): 262-266.*]

Agglutination of Horse Erythrocytes

A hemagglutinin for horse erythrocytes is common to certain tissue extracts from hamsters infected with hamster-adapted equine abortion virus but is not present in extracts from uninfected hamsters. Its activity, however, is not inhibited by specific anti-equine abortion serum, which suggests that it is not intimately associated with the viral particle. The hemagglutinin is heat labile, is sedimentable, and passes through the Selas 02 filter but not through the Seitz EK filter. All tissues of fatally infected hamsters possess a high hamster m.l.d.$_{50}$ content, but the hemagglutinin is present to a high titer only in the liver, lungs, spleen, and urine.—[*William H. McCollum, E. R. Doll, and John T. Bryans: Agglutination of Horse Erythrocytes by Tissue Extracts from Hamsters Infected with Equine Abortion Virus. Am. J. Vet. Res., 17, (April, 1956): 267-270.*]

Influence of Environment on Brucella

The dissociation of smooth (S) and smooth-intermediate (SI) types of *Brucella abortus* in liquid mediums can be prevented or significantly lowered by an adequate supply of air or oxygen to the culture. This can be accomplished by agitation, by aeration with oxygen, or by growing the cells in a shallow layer of medium.

The presence of glucose, fructose, sucrose, or DL-alanine in liquid medium in test tubes increased the dissociation of S types of *Br. abortus* but, in the presence of these agents in a shallow layer of medium in Erlenmeyer flasks, there was little dissociation observed.

The growth conditions which favored stable S and SI colonial types were suitable for rapid multiplication of those cells and also for non-S colonial types in the absence of S types. In cultures inoculated with mixed cell populations, however, the growth of non-S types of cells was suppressed in a shallow layer of medium.

The results of this study show that the atmosphere and conditions under which cells of *Br. abortus* are grown in liquid mediums are factors as important as metabolites in the causation and prevention of dissociation. Furthermore, it is not possible to evaluate the influence of metabolites on dissociation without considering the atmospheric conditions under which the cells are multiplying.—[*Evelyn Sanders and I. Forest Huddleson: The Influence of Environmental Conditions on the Growth and Dissociation of Brucella Abortus. Am. J. Vet. Res., 17, (April, 1956): 324-330.*]

Listeriosis of Sheep

A nonbacterial, listeriosis-enhancing agent (LEA) was isolated from the blood of a sheep kept on premises where listeriosis had occurred. This animal was asymptomatic, except for a transient elevation of temperature. The LEA, given to sheep in combination with *Listeria monocytogenes*, resulted in listeriosis in nearly all sheep thus exposed. Intranasal exposure of sheep to Listeria and LEA produced clinical symptoms of listeriosis in 18 to 22 days and subsequent death after a course of a relatively few days. Listeria organisms were confined to the central nervous system.

An infection different from natural listeriosis was produced by intravenous administration of Listeria with LEA. The LEA could be demonstrated only by its inoculation, simultaneously with Listeria organisms, into susceptible sheep.

The LEA could apparently be propagated in chicken embryos and HeLa cell cultures but had no specific effect on the embryos or cells of the tissue culture.—[*C. Olson and D. Segre: An Agent Enhancing Listeriosis of Sheep. Am. J. Vet. Res., 17, (April, 1956): 235-242.*]

Phenothiazine Therapy for Dogs

Phenothiazine in continuous daily doses (for 60 days), up to 66 mg. per kilogram of body weight, caused no apparent signs of toxicity in dogs. In daily doses of 4 to 33 mg. per kilogram, a reduction in percentage of larvae recovered as adults, average maximum eggs per gram counts, and percentage of eggs developed was reduced in all animals. At a dosage of 33 mg. per kilogram, no eggs were produced. At dosage of 4 to 17 mg. per kilogram, less than 0.5 per cent of *Ancylostoma caninum* ova developed when cultured.—[*R. R. Bell: Continuous Phenothiazine Therapy of Dogs Artificially Infected with Ancylostoma Caninum. Am. J. Vet. Res., 17, (April, 1956): 279-282.*]

Effect of Phenothiazine on the Horse Thyroid

Single therapeutic doses of commercial phenothiazine, N.F., which contains iodine as an impurity, depressed the thyroidal uptake of radioiodine (I^{131}) in Thoroughbreds. Potassium iodide in amounts comparable to the iodine content of commercial phenothiazine gave similar results.

Purified phenothiazine did not reduce thyroidal iodine uptake in the horses. Low-level, commercial

phenothiazine therapy (2 Gm. daily) did not affect thyroidal uptake. Examination of the plasma disappearance curves, tissue distribution, and protein-iodine determinations due to commercial phenothiazine and potassium iodide indicated that phenothiazine, *per se*, in therapeutic doses had little, if any, effect on the thyroid function of the horse.—[*B. F. Trum and R. H. Wasserman: Studies on the Depression of Radioiodine Uptake by the Thyroid After Phenothiazine Administration. II. Effect of Phenothiazine on the Horse Thyroid. Am. J. Vet. Res., 17, (April, 1956): 271-275.*]

FOREIGN ABSTRACTS

Complement Fixation in Rabies

Brain extracts from mice and rabbits inoculated with rabies virus may be used as antigen for the complement-fixation test. Negative reactions indicate that no rabies virus is present. Positive reactions are not specific—one third of the positive reactions were found to be negative by histological and animal-inoculation tests.

Complement fixation is, therefore, not specific for rabies virus.—[*R. Duponx and P. Meriveille: The Value of Complement Fixation in the Diagnosis of Rabies. Ann. Inst. Pasteur, 90, (1956): 182-186.*]—J.P.S.

Experimental Production of Mammary Malformations

Male hormone (testosterone proprionate), injected into pregnant mice, provokes a male histogenesis of the mammary gland of female fetuses. Mammary buds separate from the epidermis and some are destroyed. The formation of the nipple is inhibited.

Estrogenic hormone (estradiol propionate), injected into the fetus, produces numerous malformations of the mammary gland and nipple.

Estradiol dipropionate administered to pregnant mice at the twelfth or thirteenth day of gestation induced a large number of malformations in the mammary glands of the fetuses.

These observations indicate that administration of estrogens, even in low dosages (6 to 10 mg./kg.), may have deleterious effects on the mammary gland of the human fetus.—[*A. Raynand and Jeanne Raynand: Experimental Production of Mammary Malformations in Mice by the Action of Sexual Hormones. Ann. Inst. Pasteur, 90, (1956): 39-91; 187-220.*]—J.P.S.

A Test for Liver Function in the Cow

Cows were injected intravenously with galactose in a 40 per cent solution (0.25 Gm./kg.). The blood sugar was determined by the Hagedorn-Jensen method before injection and 15, 30, 60, and 120 minutes postinjection. In 4 normal cows, there was an increase at 15 minutes of 23, 6, 31, and 24 mg./100 ml. of blood. At 30 minutes, the blood sugar had returned to the preinjection level or slightly below it. In 7 "sick" cows which showed pathological livers at necropsy, the preinjection range of blood sugar was 54 to 68 mg./100 ml. At 15 minutes, it was 67 to 105 mg./100 ml.; at 30 minutes, it was still elevated in all cows; at 60 minutes, 3 cows still showed a significant elevation and the others were slightly above preinjection levels. The author suggests that the test might be used for early diagnosis of metabolic disease in high-producing cows.—[*A. G. Savoiski, Moscow Vet. Acad.: Functional Investigation of the Liver in High Producing Cows. Veterinariya, 32, (Nov., 1955): 55-57.*]—R.E.H.

Prostigmine in Atony of the Ruminant Stomach

A subcutaneous dose of prostigmine (20 mg.) in a 1,100-lb. cow produced a general cholinergic reaction of excessive severity. This was followed by a five-hour period of colic with no sounds of peristalsis, and no defecation, but with rapid pulse and respiration. Atropine produced a paradoxical exacerbation of the symptoms.

The author reduced the dose to 5 mg., repeated after 30 minutes. This was tested in 20, 700- to 1,100-lb. cows with atony of the rumen. Adequate stimulation of stomach motility was obtained in all but 1. The exception was shown at necropsy to have severe inflammation of the reticulum, rumen, and intestine. The period of stimulation was followed by depression of gastrointestinal motility and acceleration of the pulse and respiration.

Twelve cows recovered after one or two treatments; 7 were temporarily stimulated but did not recover until a concomitant disease of the genital tract or udder was corrected.—[*S. A. Ivanovski, Bashkir Agric. Inst.: The Use of Proserine in Atony of the Forestomach of Cattle. Veterinariya, 32, (Nov., 1955): 58-60.*]—R.E.H.

BOOKS AND REPORTS

Osteology and Arthrology of Domestic Animals

In the fourth edition (1953) of this text, I feel the authors should be complimented highly for their opinion that, "the horse still remains the most valuable type animal for the study of veterinary anatomy."

The text of 288 pages is fully illustrated with 205 figures, all of which are drawings, and the quality of the paper used brings them out clearly.

Accuracy in a drawing in regard to topography is essential, especially in the skeleton figures of our large animals. Therefore, in figure 1, "Skeleton of the Horse," the relationship of the thoracic limb to the thorax should be changed and the patella should be set higher on the trochlea of the femur.

The descriptive material of the text is complete and specific in detail.

It will be a great achievement when the nomenclature in the field of anatomy becomes stand-

ardized in a simplified, modern, workable manner which would allow more energy of the student to be spent on form and structure and less on difficult terminology.—[*McFadyean's Osteology and Arthrology of the Domestic Animals. 4th ed. By H. V. Hughes and J. W. Dransfield. Bailliere, Tindall and Cox, 7 and 8 Henrietta Street, W.C. 2, London. 1953. Price not given.*]—J. D. GROSSMAN.

Tuberculosis of Cattle

This popular pamphlet of 40 pages contains eight articles dealing generally with tuberculosis in man and also with the pathological changes, clinical diagnosis, and eradication of tuberculosis in cattle.

Special articles are devoted to tuberculosis of the udder and to the protection of human beings.

In the final chapter, there is a short report on the main principles of the control of tuberculosis in cattle in Germany.—[*Goerttler and Kruger: Tuberculosis of Cattle. S. Hirzel, Leipzig, Germany. 1956. Price not given.*]—F. KRAL.

Histopathology

This manual on histopathology has been written without excessive details for veterinary students and veterinarians.

The general part discusses histopathological findings of various pathological conditions. The first chapter deals with general histopathology of inflammatory conditions in various stages and in specific disorders. The next discusses the histopathology of tumors of different types—their origin and character.

Special attention has been given to the cirulatory, hemopoietic, expiratory, digestive, urinary, and genital organs, nervous system, and endocrine glands. The last chapter describes the histopathology of various skin disorders.

This much needed work in veterinary medicine has been written clearly and the numerous illustrations are an easily understood and helpful supplement to the text.—[*G. Pallaske: Histopathology (Pathologische Histologie). 364 pages. 434 illustrations. Gustav Fisher, Jena, Germany. 1955. Price D.M. 4,900.*]—F. KRAL.

New Horizons in Animal-Human Health Relationships

This is one of two papers presented before the veterinary hygiene section of the sixty-third Health Congress of the Royal Society of Health in Blackpool, England, last April (1956). The authors review early relationships of animals and man, the recognition of disease transmission between them, and other circumstances which have brought appreciation of veterinary public health as an important phase of the public health field and as a career for an increasing number of veterinarians.

Veterinary public health has been defined as the "field of activity which protects and advances human well-being by utilizing the combined knowledge and resources of all those concerned with human and animal health and their inter-relationships." Also discussed are the primary educational responsibility in training veterinarians for health work; the need for their postgraduate training; the areas of responsibility involved (zoonoses, food hygiene, occupational health, epidemiology, experimental medicine and surgery, chronic diseases and the aging process, training problems, etc.); and the need for long-range planning and well-defined objectives for future development of veterinary public health programs and personnel.

The authors conclude with the prediction that veterinarians will come to be recognized as preeminently qualified for leadership, not only in animal health programs but in long-range plans for improving the health of man.—[*James Lieberman and R. H. Helvig: New Horizons in Animal-Human Health Relationships. Papers for discussion at 63rd Health Congress, Royal Society of Health, Blackpool, England, April 24-27, 1956. Published by the Royal Society of Health, 90, Buckingham Palace Rd., London, S. W. 1. Price not given.*]

Animal Housing in Relation to Public Health

The author discusses measures to prevent introduction of disease into herds and flocks, such as isolation housing, "swill boiling," rat control, water sanitation, and avoidance of contaminated pastures; also measures to prevent spread of disease if introduced, such as farmyard sanitation, clean building interiors, proper ventilation, good design of dairy barns and stalls, fly control, and general sanitation.—[*J. O. L. King: Animal Housing in Relation to Public Health. This is the second of the two papers referred to in the foregoing abstract and has the same reference source.*]—J.G.H.

Manual of Milk Inspection

The first chapter of this manual deals with the determination of the freshness of milk by means of various tests.

The second chapter discusses proof of pasteurization and the analysis of dirt and bacteria found in milk. The analysis of cell types found in normal milk is compared with those found in the milk of sick dairy cows. Special attention is given to the finding of pathogenic and saprophytic organisms in the milk.

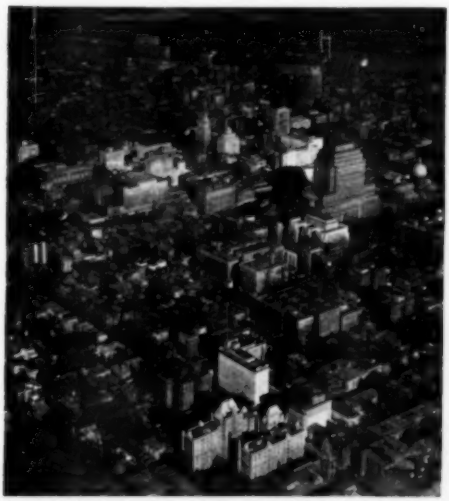
A chapter is devoted to various testing methods by which cow, sheep, goat, and human milk can be differentiated.

Special chemical methods are recommended for analysis of fat, specific gravity, and various chemicals used for the preservation of milk. The manual is written clearly and is well supplemented by good illustrations. It may serve as an aid for those who work in milk inspection.—[*W. Schonherr: Manual of Milk Inspection (Leitfaden der Milchuntersuchung). 250 pages. 85 illustrations. S. Hirzel, Leipzig, Germany. 1956. Price DM 19.00.*]—F. KRAL.

Canadian Association to Meet in Montreal—July 19-21

The eighth annual convention of the Canadian Veterinary Medical Association will be held at the Sheraton-Mt. Royal Hotel in Montreal, July 19-21, 1956.

Different aspects of veterinary activities and animal industry will be discussed by some 15 speakers among whom are: Floyd Cross, president of the AVMA, Fort Collins, Colo.; Sir Thomas Dalling, senior veterinarian, F.A.O., Rome, Italy; R. Vuillaume, director of the veterinary services of France; A. Brion, professor of medicine at the National Veterinary School, Alfort, France; Vittorio Zavagli, director of the Zooprofilassi Institute, Rome, Italy; R. E. Lubbehusen, St. Louis, Mo.; K. F. Wells, veterinary director general of Canada, Ottawa, Ont.; E. E. Ballantyne, president of the C.V.M.A., Edmonton, Alta.; P. Choquette, Quebec Veterinary School, St. Hyacinthe, Que.; and others. A special invitation is extended to all members of the AVMA to come to Montreal on this occasion.



An aerial view of a section of Montreal's business district with the St. Lawrence River in the background.

S/ROLAND FILION.

AAHA Officers Elected at Miami Meeting

The American Animal Hospital Association held its twenty-third annual convention at the Fontainebleau Hotel, Miami Beach, Fla., on May 22-25, with over 750 veterinarians in attendance. Officers installed for the coming year include: Drs. James H. Yarborough, Miami, Fla., president; Joseph A. A. Millar, Deal, N.J., president-elect; William G. Magrane, Mishawaka, Ind., vice-president; W. H. Riser, Skokie, Ill., executive secretary; and A. R. Theobald, Cincinnati, Ohio, treasurer.

Dr. James H. Yarborough

Elected to the executive board were: Drs. L. R. Barto, Basking Ridge, N.J.; Robert P. Knowles, Miami, Fla.; Frank Booth, Elkhart, Ind.; Lee R. Phillips, Lakewood, Colo.; William K. Riddell, Los Angeles, Calif.; and Joseph L. Ellis, Olympia, Wash.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A., Agricultural Research Service, are reported as of May 21, 1956.

RETIREMENTS

Jay B. Current, Indianapolis, Ind.
Timothy Foley, Sandusky, Ohio.
Milton R. Sharp, Los Angeles, Calif.

DEATH

Clarence C. Merriman, Los Angeles, Calif.

TRANSFERS

Josef Briks, from Boston, Mass., to Potsdam, N.Y.
Robert N. Birdwhistell, from Fostoria, Ohio, to Fort Dodge, Iowa.
Robert G. Freel, from Boston, Mass., to Richmond, Va.
Orville J. Halverson, from Phoenix, Ariz., to Portland, Ore.
William H. Jackson, from Madison, Wis., to Trenton, N.J.
Winthrop C. Ray, from Montpelier, Vt., to Madison, Wis.
William T. Shalkop, from Washington, D.C., to Beltsville, Md.
Clarence A. Tervola, from Los Angeles, Calif., to Madison, Wis.
William A. Wernet, from Cleveland, Ohio, to South St. Paul, Minn.

COMMENCEMENTS

University of Georgia.—At the 1956 commencement exercises of the School of Veterinary Medicine, University of Georgia, the following 57 candidates were presented for the D.V.M. degree:

Leon Adams, Jr.
H. Powell Anderson
William M. Atkins
Amos J. Barfield
William J. Benton
Dilmus M. Blackmon
John F. Brown
W. Henry Burger
Harold K. Chandler
Raiford L. Claxton
Phillip H. Coleman
Frank R. Craig
John B. Davis
John A. Finnegan
Herschel H. Flowers
Thomas F. Fussell
Donald R. Glotfelty
William B. Griffin
Bernard D. Griffith
John H. Henderson, Jr.
Eddie B. Hudspeth
James R. Hundley
James L. Johenning
Guy R. Jones
John H. Keil
Herbert W. Kelly, Jr.
Willie Jim Kirkland
Harry M. Lightsey, Jr.
David L. Lynn
Charles J. Maddox
William H. Marsh
G. Lawrence Mitchell
R. Dwight Peterson
Thomas W. Powell
Harry H. Price, Jr.
Jesse L. Roberts, Jr.
John A. Roeder, Jr.
Jolly H. Rogers
William R. Rosenburger
Ralph W. Seamon
Mames B. Sharp, Jr.
Clark H. Shingler
David H. Spearman
Charles M. Speegle
Thomas E. Staton
Al W. Stinson
Bobby G. Sumner
F. Colson Taylor
Robert C. Thrasher
Walter E. Tucker

Graduating Class, 1956, School of Veterinary Medicine, University of Georgia

Top row (left to right) — Bernard D. Griffith, Eddie B. Hudspeth, Thomas W. Powell, William H. Marsh, Guy R. Jones, John B. Davis, R. Dwight Peterson, Charles M. Speegle, John A. Finnegan, Walter T. Vaught.

Second row—Willie Jim Kirkland, S. Jack Ward, John A. Roeder, Jr., G. Lawrence Mitchell, John H. Keil, Jr., Leon Adams, Jr., Henry Burger, Jolly H. Rogers, John H. Henderson, H. Powell Anderson.

Third row—Phillip H. Coleman, John F. Brown, Walter E. Tucker, Bobby G. Sumner, Dilmus M. Blackmon, William J. Benton, Harold K. Chandler, Conrad L. Williams.

Fourth row—David H. Spearman, James B. Sharp, Jr., Clark H. Shingler, F. Colson Taylor, Charles J. Maddox, Harry M. Lightsey, Jr., Robert A. Wright, William M. Atkins, Raiford L. Claxton.

Fifth row—Thomas F. Fussell, Amos J. Barfield, Donald R. Glotfelty, David L. Lynn, Frank R. Craig, Ralph N. Seamon, Harry H. Price, Jr., William R. Rosenberger, William B. Griffin, James L. Johenning.

Sixth row—Herbert W. Kelly, James R. Hundley, Herschel H. Flowers, Jesse L. Roberts, Jr., H. Allen Virts, F. Ray Turk, Robert C. Thrasher, Al W. Stinson, Thomas E. Staton.

F. Ray Turk
Walter T. Vaught
H. Allen Virts
S. Jack Ward
Conrad L. Williams
Robert A. Wright
R. E. Wright

• • •

Ohio State University.—At the 1956 commencement exercises of the College of Veterinary Medicine, Ohio State University, the following 67 candidates were presented for the D.V.M. degree:

John E. Andreas
William E. Bates
Albert I. Bauer
Guy R. Beretich
Ernest G. Boone, Jr.
James W. Brammer
David R. Bright
Donald T. Buck
Deshler B. Cameron
Harry V. Conley
David P. Cooley
William C. Davis
William E. Davis, Jr.
William H. Davis
Clarence Dinnen
Thomas A. Dunderman

Graduating Class, 1956, College of Veterinary Medicine, Ohio State University

Top row (left to right)—Ned W. Rudd, William E. Davis, Jr.

Second row (including officers in center)—Richard N. Schmidt, Dustin Stinson, Jack M. Rogers, William H. Davis, Harrison M. Gardner, John E. Andreas, Joseph P. Henley, Merle T. Kelley.

Third row—Ernest G. Boone, Jr., James T. Stockstill, George W. Hansel, Wilfred C. Wood, Richard W. Johnson, Carlene A. Joseph.

Fourth Row—Albert I. Bauer, Roger A. Yeary, James S. Elder, John W. Miller, Richard C. Piper, James W. Brammer, Caroll S. Stottlemyer, Roland R. Stewart, David P. Cooley, William L. Lovell.

Fifth row—David R. Bright, Carlton C. Stanforth, Merlin R. Oswalt, Stephen T. Wolford, Frederick J. Rohe, Joseph E. Orthoefer, Jerry L. Welbourn, William F. Nape, William E. Bates, Keith L. Kraner.

Sixth row—Marvin L. Lee, Norbert P. Page, Harry L. Newell, Gerald L. Shook, Robert M. Hall, Thomas O. Miller, James L. Warner, Robert L. Smith, William C. Davis, James D. Kornder.

Seventh row—Daniel A. Farwick, Charles R. Pressler, William R. Kerpsack, Harry V. Conley, Leland C. Lynch, Jr., Bruce D. Miller, Richard S. Witter, John W. Richardson, Clarence Dinnen, Thomas A. Dunderman.

Eighth row—Carl A. Jolley, David L. Paice, Charles E. Kendall, Robert W. Kerpsack, William O. Smith, Wallace E. Townsend, Deshler B. Cameron, Orville G. Wiseman, Jr., Donald T. Buck, Guy R. Beretich, V. David Hein.

James S. Elder
Daniel A. Farwick
Harrison M. Gardner
Robert M. Hall
George W. Hansel
V. David Hein
Joseph P. Henley
Richard W. Johnson
Carl A. Jolley
Carlene A. Joseph
Merle T. Kelley
Charles E. Kendall
Robert W. Kerpsack
William R. Kerpsack
James D. Kornder
Keith L. Kraner
Marvin L. Lee
Leland C. Lynch, Jr.
William L. Lovell
Bruce D. Miller
John W. Miller
Thomas O. Miller
William F. Nape
Harry L. Newell
Joseph E. Orthoefer
Merlin R. Oswalt
Norbert P. Page
Davie L. Paice
Richard C. Piper
Charles R. Pressler
John W. Richardson
Jack M. Rogers
Frederick J. Rohe
Ned W. Rudd
Richard N. Schmidt
Gerald L. Shook
Robert L. Smith
William O. Smith
Carlton C. Stanforth
Roland R. Stewart
Dustin Stinson
James T. Stockstill
Caroll S. Stottlemyer
Wallace E. Townsend
James L. Warner
Jerry L. Welbourn
Orville G. Wiseman, Jr.
Richard S. Witter
Stephen T. Wolford
Wilfred C. Wood
Roger A. Yeary

• • •

University of Toronto.—At the 1956 commencement exercises of the Ontario Veterinary College, University of Toronto, the following 57 candidates were presented for the D.V.M. degree:

Wayne C. Batty
Arthur H. Brightwell
Gladstone C. T. Brown
Philip S. Bryant
Kenneth M. Charlton
Garnet D. Collins
Allan R. Corey
David L. Courtice
Joanne G. Currier
William J. B. Ditchfield

(Continued on page 94)

Graduating Class, 1956, Ontario Veterinary College, University of Toronto

Top row (left to right)—Wayne C. Batty, Arthur H. Brightwell, Gladstone C. T. Brown, Philip S. Bryant William J. Dorward, Allan R. Corey, David L. Courtice, Leslie H. Lord, Niels O. Nielson, S. R. C. Carloto, Kenneth M. Charlton, Garnet D. Collins, Joanne G. Currier.

Second row (left to right)—William J. B. Ditchfield, Robert H. Dunlop, Wellie Freeburn, Kenneth R. Gadd, Bernard J. J. Gahagan, Wayne L. Gerrie, J. Archibald, John G. Hare, Clifford A. Hatfield, Michael F. Herlihey, John G. Hill, John Howell, Donald W. Hughes.

Third row, (left to right)—Doodnath W. Kanhai, James E. Kelso, Alfred Kennedy, Haskell I. Konigsberg, Robert M. Liptrap, Pearce A. Louisy, Ross C. Major, Ross J. Marra.

Fourth row, (left to right)—Alvin E. Martin, Reginald G. M. Martin, Vicki Moszkowski, David A. Murphy, Thomas V. Murphy, Barry A. McDonald, Eleanor Y. MacQuarrie, Howard R. McCarnan, James P. Perry, Isaac R. Reid, Morley F. Rendall, Jack H. Robb.

Fifth row (left to right)—Lea A. Roberts, Richard F. Roelofson, Morley T. Rutherford, Oliver A. Scroggie, Hugh J. Sheppard, Charles M. Smith, Robert E. Smith, Owen R. Stevens, Frederick W. Stewart, Seymour B. Tobe, William O. Wright, Arian Zarkower.

Graduating Class, 1956, College of Veterinary Medicine, State College of Washington

Top row (left to right)—Lindley Allen, David Beckstead, Marion Brown, Lewis Clark, Winthrop Dale, Lowell Dorius, Robert Haug.

Second row (left to right)—Billy Heron, William Hess, Donald Holliday, Keith Hoopes, Darrell Hyde, Donald Kearns, John McCleary.

Third row (left to right)—John McDonald, Thomas Macauley, Hugh Maycumber, Don Miles, Howard Miller, John Prentice, David Relling.

Fourth row (left to right)—Gilbert Riek, Alva Roberts, Charles Schroeder, Dorothy Schroeder, William Sherrod, Merrill Shupe, William Smith.

Fifth row (left to right)—Laurence Soderholm, George Stabenfeldt, James Starnes, Fred Stovner, Bruce Stucki, William Tavenner, Ray Turner.

Sixth row (left to right)—Win Van Pelt, Ronald Vinyard, Cecil Watson, William Wellington, Robert Whittaker, Gordon Wimpenny, Richard Zellmer.

(Continued from page 92)

William J. Dorward
Robert H. Dunlop
Wellie Freeburn
Kenneth R. Gadd
Bernard J. J. Gahagan
Wayne L. Gerrie
John G. Hare
Clifford A. Hatfield
Michael F. Herlihey
John G. Hill
John Howell
Donald W. Hughes
Doodnath S. Kanhai
James E. Kelso
Alfred Kennedy
Haskell I. Konigsberg
Robert M. Liptrap
Leslie H. Lord
Pearce A. Louisy
Ross C. Major
Ross J. Marra
Alvin E. Martin
Reginald G. M. Martin
Vicki Moszkowski
David A. Murphy
Thomas V. Murphy
Barry A. MacDonald
Eleanor Y. MacQuarrie
Howard R. McCarnan
Niels O. Nielsen
James P. Perry
Isaac R. Reid
Morley F. Rendall
Jack H. Robb
Lea A. Roberts
Dmytro Rodyniuk
Richard F. Roclofson
Morley T. Rutherford
Oliver A. Scroggie
Hugh J. Sheppard
Charles M. Smith
Robert E. Smith
Owen R. Stevens
Frederick W. Stewart
Seymour B. Tobe
William O. Wright
Arian Zarkower

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State College of Washington.—At the 1956 commencement exercises of the College of Veterinary Medicine, State College of Washington, the following 42 candidates were presented for the D.V.M. degree:

Lindley Allen
David Beckstead
Marion Brown
Lewis Clark
Winthrop Dale
Lowell Dorius
Robert Haug
Billy Heron
William Hess
Donald Holliday
Keith Hoopes
Darrell Hyde
Donald Kearns
John McCleary
John McDonald
Thomas Macauley
Hugh Maycumber
Don Miles
Howard Miller
John Prentice
David Relling
Gilbert Riek
Alva Roberts
Charles Schroeder
Dorothy Schroeder
William Sherrod
Merrill Shupe
William Smith
Laurence Soderholm
George Stabenfeldt
James Starnes
Fred Stovner
Bruce Stucki
William Tavenner
Ray Turner
Win Van Pelt
Ronald Vinyard
Cecil Watson
William Wellington
Robert Whittaker
Gordon Wimpenny
Richard Zellmer

AMONG THE STATES AND PROVINCES

District of Columbia

District Association.—The District of Columbia Veterinary Medical Association held its third quarterly meeting on May 8, 1956, in the auditorium of the Armed Forces Institute of Pathology at Walter Reed Army Medical Center.

The program for the evening was the second annual honorary lecture. The speaker was Dr. William A. Hagan, dean and professor of bacteriology at New York State Veterinary College at Cornell University. Dr. Hagan chose as his topic, "The Evolution of Viral Diseases of Animals."

Indiana

Donham Scholarship Established.—The recently established Donham Memorial Scholarship Fund will be administered as one of the undergraduate scholarships at Purdue University and will be awarded to needy undergraduate students studying in the preveterinary or animal agriculture areas. The Purdue Alumni Scholarship Foundation will accept donations and administer the fund.

Dr. Donham had been on the University staff since 1940, serving as head of the Department of Veterinary Medicine until 1950 when he voluntarily stepped down to assistant because of ill health. His obituary appeared in the June 1 JOURNAL (p. 570).

Pennsylvania

Conference for Regulatory Veterinarians.—An animal disease conference for regulatory veterinarians from the eastern states was held on May 25 at the School of Veterinary Medicine, University of Pennsylvania. Those participating in the program included: Drs. H. W. Johnson, chief, Animal Disease and Parasite Research Branch, ARS, U.S.D.A., Washington, D.C., and Walter E. LaGrange, Philadelphia, Pa. (bovine tuberculosis); Howard A. Milo, Harrisburg, Pa., and Charles J. Hollister, Kennett Square, Pa. (bovine brucellosis); Frank A. Todd, U.S.D.A., and Col. Fred D. Maurer, A.F.I.P., both of Washington, D.C. (exotic diseases); and William F. McLimans, Philadelphia, Pa. (nature of viruses). Dr. A. L. Brueckner, College Park, Md., acted as chairman.

DEATHS

★**William Caslick** (COR '27), 54, Paris, Ky., died June 3, 1956. Dr. Caslick was a general practitioner. He was a member of the Kentucky and Central Kentucky Veterinary Medical Associations and of the AVMA. His parents and his widow survive.

Robert J. Dunleavey (GWU '10), 79, Syracuse, N. Y., died May 2, 1956. Dr. Dunleavey retired from practice in 1945. He is survived by four sons and 15 grandchildren.

★**Milton R. Evans** (OSU '39), 41, Long Beach, Calif., died April 12, 1956. Dr. Evans was a member of the California State Veterinary Medical Association and of the AVMA.

Albert G. Griesbach (CIN '16), Loveland, Colo., died March 28, 1956. Dr. Griesbach had practiced in Loveland for 34 years.

Joseph L. Hearn (KCV '08), 72, Texarkana, Texas, died on Jan. 12, 1956. Dr. Hearn had served with the Bureau of Animal Industry, U. S. Department of Agriculture. He had retired recently.

★Indicates members of the AVMA.

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PROFESSIONAL LITERATURE AVAILABLE ON REQUEST

Department of Veterinary Medicine

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ORGANIZATION SECTION

Nominations for Executive Board in Districts VI and VIII

As the result of primary balloting completed on May 30, 1956, the following nominees appear on final election ballots which were mailed to AVMA members in the two districts on June 11:

DISTRICT VI (Arizona, California, Canal Zone, Central America, Colorado, Mexico, Nevada, New Mexico, Utah)

Dr. J. M. Arburua, San Francisco, Calif.
Dr. Keith O. Lassen, Mesa, Ariz.
Dr. Vyrle D. Stauffer, Arvada, Colo.
Dr. Walter W. Stiern, Bakersfield, Calif.
Dr. William J. Zontine, Lancaster, Calif.

DISTRICT VIII (Arkansas, Kansas, Louisiana, Missouri, Oklahoma, Texas)

Dr. Dan J. Anderson, Smithfield, Texas
Dr. W. W. Armistead, College Station, Texas
Dr. W. G. Brock, Dallas, Texas
Dr. Lewis H. Moe, Stillwater, Okla.
Dr. Fred B. Ogilvie, Kansas City, Kan.

Drs. Harry W. Boothe and Erich R. Maschgan of Chicago served as tellers on June 1 and certified the results above reported.

The polls for this election will close on July 10, 1956, and the candidates elected will take office for five-year terms at the conclusion of the annual meeting in San Antonio next October.

STUDENT CHAPTER ACTIVITIES

Oklahoma Chapter.—During this past semester, the AVMA Student Chapter at Oklahoma A. & M. College has made a great deal of progress. Throughout the semester, we have had excellent speakers, many of whom were outstanding in other fields as well as those in veterinary medicine.

We recently selected a new slate of officers for the fall semester who we feel will aid the chapter in even further progress. These officers are as follows: Bill Askew, president; Robert Godby, president-elect; Clay Posey, secretary; Thomas Lathan, treasurer; Bert Briscoe, editor; Robert Spragg, assistant editor; Jim Ward, senior class representative; Joe Jolliffe, junior class representative; Ray Baird, sophomore class representative.

Bill Askew was chosen to represent our Chapter as delegate to the AVMA convention in October. Leon Self will serve as alternate.

On May 17, our annual program for honoring graduating seniors was held. At this time, Dean D. R. Peterson administered the veterinarian's oath to all graduating seniors. The Dean McElroy Award and the AVMA Women's Auxiliary Award were both presented to Donald R. Callicott. All the graduating seniors were presented their AVMA certificates. The wives of the graduating seniors were presented P.H.T. (pushing husband through) degrees. We are looking forward to an even better year.

S/PAUL L. KUNNEMAN, *Secretary.*

• • •

Texas Chapter.—The Student Chapter of the AVMA at Texas A. & M. enjoyed an active spring semester with excellent student and faculty participation. Large student attendance at all meetings was stimulated by the policy that no major examinations were given on days following chapter meetings. Many members of the faculty were actively interested in the chapter and attended each meeting.

Meetings were held every second and fourth Tuesday of each month. President-Elect Gerald Van Hoosier provided a fine program for the meetings. Speakers who addressed the student chapter during the semester and their subjects were: Dr. H. H. Payne—The Work and Progress of the Livestock Sanitary Commission of Texas; Dr. Donald Price—Opportunities for a Ranch Veterinary Practice in West Texas; Dr. A. O. Betts—Virus Diseases of Livestock; Dr. R. E. Norton—The Interdependence Between the Veterinarian and His Associates; Dr. Harry H. Pelot—Technics in Restraint and Surgery of Small Animals; Dean W. W. Armistead—Buried Skin Autographs; Dr. David H. Morgan, president of Texas A. & M. College—You as a Veterinarian; and Mr. Jack Sloan—The Texas Friend Ship.

Among the social activities was the annual student chapter banquet and ball held on April 14. It was enjoyed by more than 250 persons. On May 15, the annual chapter barbecue was held along with a softball game (faculty vs. seniors). The outcome of the game was a hilarious dispute, with both teams claiming victory.

Faculty awards for outstanding achievements were given to Joe David Ross of the freshman class, James B. Hensen of the sophomore class, Wallace Kleb of the junior class, and Walter E. Roe of the senior class. The AVMA Auxiliary Award for outstanding student achievement in veterinary medicine was presented to Chapter President James W. Ard. The Louisiana Women's Auxiliary Award for achievement by a graduating Louisiana student was given to Wallace Larson. The student chapter gave Bryan Beard and Wallace Larson, co-editors of the *Southwestern Veterinarian*, each a pen-and-pencil set in appreciation for their outstanding work in editing.

The student auxiliary met with the chapter at the last meeting on May 22. Dean W. W. Armistead presented each graduate with a certificate which the AVMA issues to student chapter members. Wives of the graduates were given token diplomas.

(Continued on p. 26)

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St. Joseph, Missouri

distemper hepatitis
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vaccine

(STUDENT CHAPTER ACTIVITIES—*cont. from p. 20*)

Graduation ceremonies were held at Texas A. & M. on May 25, with 54 graduates receiving D.V.M. degrees.

s/WILLIAM H. BULLER, *Secretary-Treasurer.*

Tuskegee Institute Chapter.—The first meeting of the spring semester was held on Feb. 18, 1956, when the presidency was turned over to Mr. Matthew Jenkins. The important business of this meeting was our annual banquet and the chapter's publication.

On April 28, our annual banquet was held in Tompkin's Hall. Dr. T. G. Perry, former director of the small animal clinic, was guest speaker. Climaxing a successful evening, Dr. Cooper announced the recipient of the annual Upjohn Award, Mr. Ellis Hall. This award is given each year to the graduating senior having done outstanding work in the clinics.

In accordance with a program established at several of the veterinary schools, the dean awarded P.H.T. (pushing husband through) degrees to wives of graduating students who had completed the veterinary aide courses given to the members of the student's auxiliary.

Our May 18 meeting concluded this semester's activities. New officers were installed for the fall semester. A progress report on the chapter's publication was given and an annual financial statement was submitted to the chapter.

s/THELMA DEAN, *Secretary.*

s/MATTHEW JENKINS, *President.*

WOMEN'S AUXILIARY

President—Mrs. Earl N. Moore, 636 Beall Ave., Wooster, Ohio.

Secretary—Mrs. F. R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind.

Recipients of 1956 Achievement Awards Given by the AVMA Women's Auxiliary.—For the seventh year, the Women's Auxiliary to the AVMA is proud to present $25 and a certificate of achievement to the outstanding student in the senior class of each of the

Left to right:

Samuel Ridout,
Alabama Polytechnic Institute.
George E. Clinton,
University of California.

• • •

Duane A. Newman,
Colorado A. & M. College.
Herbert J. Rosenoff,
Cornell University.
John H. Henderson,
University of Georgia.
Merrill W. Ottwein,
University of Illinois.

• • •

Gordon R. Held,
Iowa State College.
Frederick G. Day,
Kansas State College.
Wayne H. Sletten,
University of Minnesota.
Robert E. Hertzog,
University of Missouri.

• • •

Raynald Roy,
University of Montreal.
William H. Davis,
Ohio State University.
Donald R. Callicott,
Oklahoma A. & M. College.
Charles H. Garvin,
University of Pennsylvania.

• • •

James W. Ard,
Texas A. & M. College.
Owen R. Stevens,
University of Toronto.
Ellis M. Hall,
Tuskegee Institute.
George H. Stabenfeldt,
Washington State College.

schools of veterinary medicine in the United States and Canada.

The records of these young men show superior scholarship, accomplishments in extracurricular activities, and abilities for leadership; they possess the qualities so necessary for success in veterinary medicine. The selections are made by the deans and faculties or the respective student chapters, or both.

Our Auxiliary tries to instill in the veterinary student a desire to promote good will and understanding between veterinary medical students and the other students on the campus.

The 1956 award winners are identified in the composite picture. Their records furnished by the deans are in the files of the Women's Auxiliary.

s/(Mrs. E. A.) Marion Woelffer,
Second Vice-President.

Washington State Auxiliary.—The first issue of the Washington State Veterinary Medical Auxiliary newsletter, *The Better Half*, made its debut this year. The Auxiliary president, Mrs. June Duby, took on the task of editor and did an excellent job on the first issue.

It is planned to publish two issues a year, the next one to be out before the fall meeting in Spokane on September 21-22. Members of the publicity committee from the eight organized areas in the state have cooperated by sending news from their areas. This should be a great help towards getting better acquainted with each other, and it should strengthen our common bond in our husbands' profession.

Officers of the Auxiliary are (top, left) Mrs. George Duby, president; Mrs. H. N. Beckman, president-elect; (below, left) Mrs. B. S. Benedictson, treasurer; Mrs. Chet Griffith, secretary.

Our state Auxiliary has an ambitious program. We contribute to the Student Loan Fund and the award and research funds; we buy books for the School of Veterinary Medicine at Washington State College and also maintain a loan fund for veterinary students there. We assist the wives of veterinary students and their children, and we aim to support and assist the Washington State Veterinary Medical Association with any educational or public relations program it undertakes.

The next meeting of the Auxiliary will be during the state meeting at Spokane in September. There will be door prizes at the dinner dance, and tickets will be sold to help raise funds for our various projects.

Officers of our Washington State Veterinary Medical Auxiliary are: Mrs. George Duby, Centralia, president; Mrs. H. N. Beckman, Spokane, president-elect; Mrs. B. S. Benedictson, Yakima, treasurer; and Mrs. Chet Griffith, Seattle, secretary.

s/Mrs. O. A. Anderson, *Publicity Chairman.*

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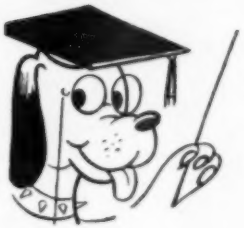

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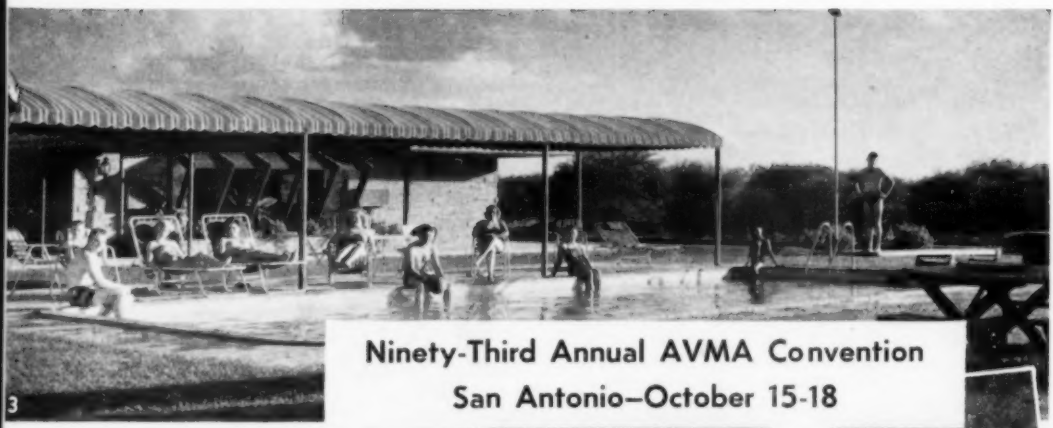


3

Ninety-Third Annual AVMA Convention
San Antonio—October 15-18

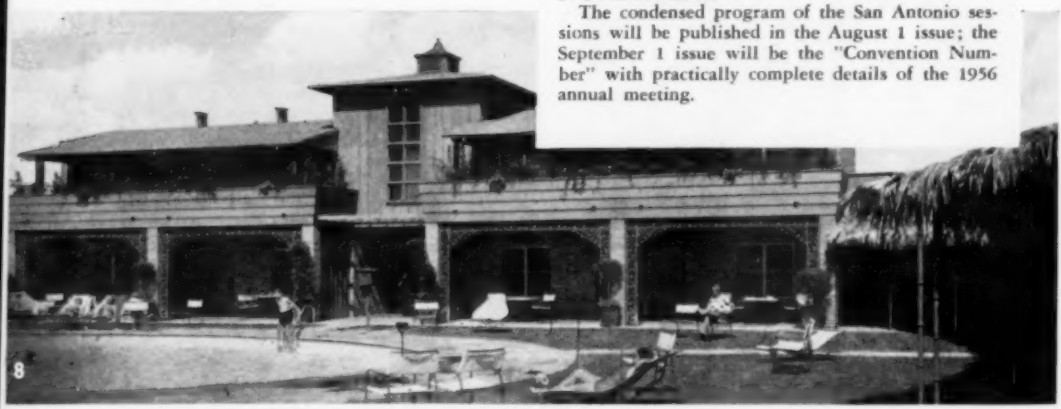
7

Hotel Reservations Are Stepping Up
Have You Made Yours?

A report from the Housing Committee for the San Antonio convention shows that requests for hotel and motel reservations have speeded up. Happiness Tours is again handling arrangements for the pre- and postconvention Texas-Mexico "round-up" tours, which were described in the May 15 JOURNAL. Mailing of the brochures was unavoidably delayed from late May until late June.

A hotel reservation map and form are on pages 30-31 of this issue.

The condensed program of the San Antonio sessions will be published in the August 1 issue; the September 1 issue will be the "Convention Number" with practically complete details of the 1956 annual meeting.



8

Motels in San Antonio: 3 — Belvidere; 7 — Rio Lado; 8 — Western

2

3

4

2—Crockett Hotel 5—Robert E. Lee
3—Gunter Hotel 6—St. Anthony
4—Menger Hotel 7—White Plaza
Lower Right-hand Corner—Plaza

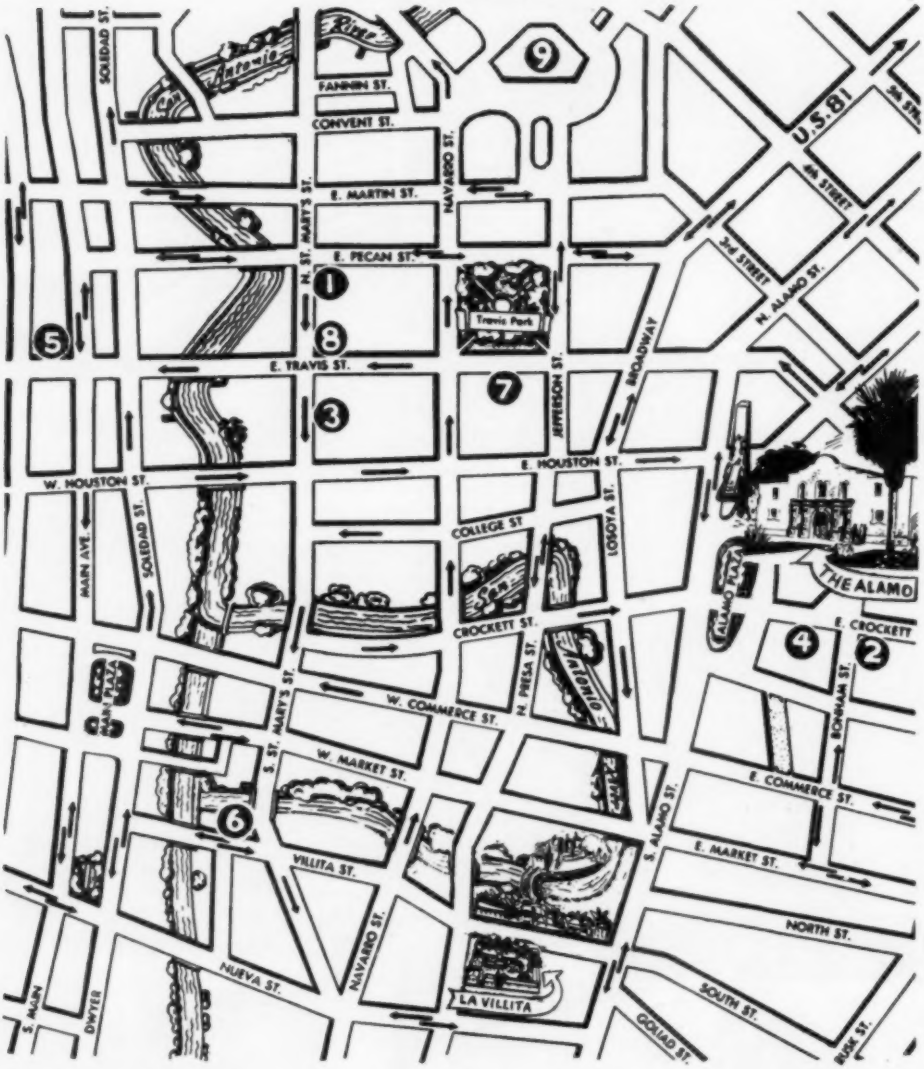
5

6

7

Hotel Map of San Antonio

The general sessions and larger section meetings will be held at the Municipal Auditorium (No. 9). The smaller section meetings will be held at the Gunter Hotel (No. 3).



1. Blue Bonnet Hotel
2. Crockett Hotel
3. Gunter Hotel
4. Menger Hotel
5. Robert E. Lee Hotel
6. Plaza Hotel
7. St. Anthony Hotel
8. White Plaza Hotel
9. Auditorium

Motel Information—Motels listed on the reservation form are located on Austin Highway, U.S. 81, which enters San Antonio via Broadway. Rio Lado Motel is at 1100 N. St. Mary's St., near the business section.

HOTEL RESERVATIONS — SAN ANTONIO CONVENTION

Ninety-Third Annual AVMA Meeting, Oct. 15-18, 1956

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

Hotels—Motels and Rates (all are air-conditioned)

HOTEL	SINGLE	DOUBLE	TWIN BEDS
1. Blue Bonnet	$3.00-5.00	$5.00-8.00	$.....
2. Crockett	$3.50-4.50	$5.50-6.50	.....
3. Gunter	$5.00 and up	$6.50 and up	.....
4. Menger	$5.00-8.00	$7.00-12.00	.....
5. Robert E. Lee	$3.50-5.00	$5.00-6.00	$6.00-8.00
7. St. Anthony	$5.00 and up	$7.00 and up	.....
8. White Plaza	$3.25 and up	$4.75 and up	.....

MOTEL	RATES
1. Aero	$7.50-9.00
2. Aloha	$6.00 and up
3. Belvedere	$6.00-10.00
4. Casa Linda	$6.00 and up
5. Koronado	$5.00 and up
6. Park	$4.00-15.00
7. Rio Lado	$6.00-10.00
8. The Westerner	$5.00 and up
9. Flamingo	$6.00 and up

Tear Here

RESERVATION FORM — AVMA CONVENTION — SAN ANTONIO

To: HOUSING BUREAU, San Antonio Visitors and Information Department, Chamber of Commerce, Insurance Building, San Antonio 5, Texas.

Please make reservations indicated below:

HOTEL

———Single room(s) at $.....

———Double bed room(s) at $.....

———Twin-bed room(s) at $.....

———Suite (specify type of accommodations wanted)

(Three choices MUST be shown)

First choice hotel _____

Second choice hotel _____

Third choice hotel _____

MOTEL

Indicate type of accommodations

(_____)
Unit, Cabin,

wanted for _____ persons at $_____
No. rate

(Three choices MUST be shown)

First choice motel _____

Second choice motel _____

Third choice motel _____

Arriving on (date) _____ at _____ a.m. _____ p.m.

Leaving on (date) _____ at _____ a.m. _____ p.m.

Will be occupied by (attach list of additional names if necessary).

Your Name (Print or Type) _____

Street Address _____ City and State or Province _____

FURADANTIN is one of the nitrofurans—a unique class of antimicrobials, unrelated to antibiotics or sulfonamides. Like all the nitrofurans, FURADANTIN is bactericidal to a wide range of both gram-negative and gram-positive organisms. It is nontoxic to kidneys, liver and blood-forming organs. Development of bacterial resistance to FURADANTIN is negligible.

In canine tracheobronchitis (kennel cough), FURADANTIN stopped the cough in 11 of 12 dogs within 3 days. Within 1 week, all were fully recovered. There were no recurrences.[1]

1. Mosier, J. E.: Vet. M. 50:605, 1955. 2. Breakey, R. S.; Holt, S. H., and Siegel, D.: J. Michigan M. Soc. 54:805, 1955.

Dose: 1 to 2 mg. per lb. of body weight, 3 times daily, for 4 to 7 days.

In urinary tract infections of dogs and cats, FURADANTIN rapidly produces high antibacterial concentrations in urine. As reported on urinary tract infections in humans, "it appears that Furadantin is one of the most effective single agents available at this time."[2]

Dose: Acute cases: 1 to 2 mg. per lb. of body weight, 3 times daily, for 7 to 10 days or longer. **Chronic cases:** 2 mg. per lb. of body weight, 3 times daily, for 10 to 14 days or longer.

SUPPLIED: Orange-red scored tablets of 10 mg., bottle of 100; yellow scored tablets of 50 mg., bottles of 25 and 100. Available through your Professional Veterinary Distributor.

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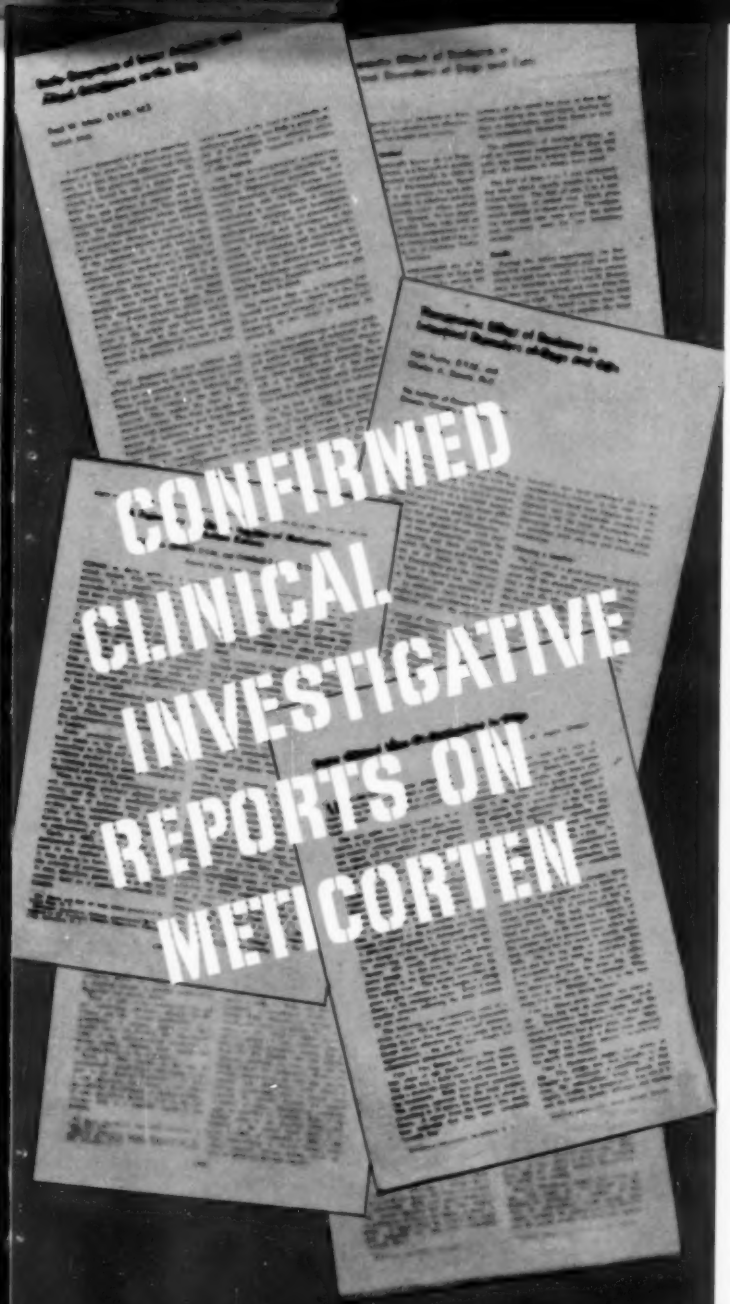

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"highly effective"[3]
"excellent results"[2]
"most gratifying"[4]

IN STRESS CONDITIONS . . .

"best use"[2]
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REFERENCES

1. *Koger, R. B.: Vet. Med. 50:713 (Dec.) 1955.*

2. *Chambers, E. E.: North Am. Veterinarian 37:105 (Feb.) 1956.*

3. *Shaw, J. C.; Gessert, R. A., and Chung, A. C.: North Am. Veterinarian 36:918, 1955.*

4. *Morris, R. G., and Hall, C. E.: J. A. V. M. A. 128:132 (Feb. 1) 1956.*

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diphemanil methylsulfate
(acetylcholine blocking agent)

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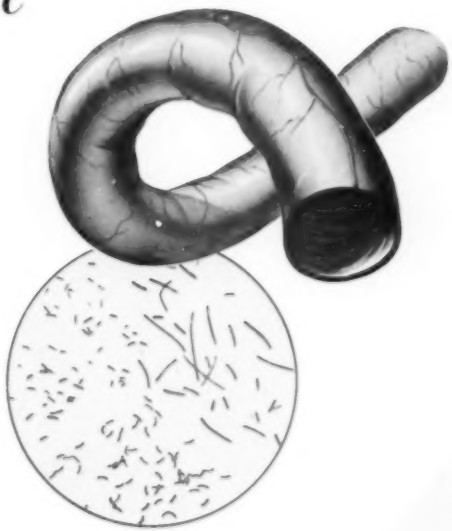
Propulsive Phase . . .

and the Infectious Phase . . .



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PACKAGING:

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jar of 24; 6 jars, 24 boluses per jar.

VARITON Compound Tablets,
bottle of 100.

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COMING MEETINGS

Mississippi State Veterinary Association. Annual meeting. Buena Vista Hotel, Biloxi, July 15-17, 1956. Harvey F. McCrory, P.O. Box 536, State College, secretary.

Kentucky Veterinary Medical Association. Annual meeting. Seelbach Hotel, Louisville, July 16-17, 1956. Robert H. Singer, 136 Shawnee Pl., Lexington, secretary.

Iowa State College. Annual conference for veterinarians. Memorial Union, Iowa State College, Ames, July 17-18, 1956. John B. Herrick, Iowa State College, Ames, co-chairman of conference.

Virginia Veterinary Medical Association. Summer meeting. Natural Bridge Hotel, Natural Bridge, July 15-17, 1956. Wilson B. Bell, 1303 Hillcrest Dr., Blacksburg, secretary.

Canadian Veterinary Association and the College of Veterinary Medicine of the Province of Quebec. Annual joint congress. Sheraton-Mont Royal Hotel, Montreal, July 19-21, 1956. Jacques St. Georges, publicity committee.

Alabama Polytechnic Institute. Annual conference for veterinarians. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala., July 22-25, 1956. R. S. Sugg, dean.

Michigan State University, College of Veterinary Medicine. One-day conference on radiology for veterinary practitioners. Kellogg Center, M.S.U. campus, East Lansing, Aug. 1, 1956. C. F. Clark, dean.

Veterinary Public Health Session, to be held in conjunction with the annual health conference, Pennsylvania State University, State College, Pa., on Aug. 21, 1956, at 2:00 p.m. Rabies, trichinosis, brucellosis, and food poisoning will be discussed. Ernest J. Witte, P.O. Box 90, Harrisburg, Pa., chief, Division of Veterinary Public Health.

Colorado Veterinary Medical Association. Annual meeting. Estes Park, Sept. 7-9, 1956. G. H. Gilbert, 5500 Wadsworth Blvd. Arvada, Colo., secretary.

New Mexico Veterinary Medical Association. Annual meeting. Cal Boykin Hotel, Portales, Sept. 10-11, 1956. W. L. Black, Portales, N. M., chairman, program committee.

Pennsylvania State Veterinary Medical Association. Annual meeting. Bedford Springs Hotel, Bedford, Pa., Sept. 12-14, 1956. Raymond C. Snyder, N.W. Corner Walnut St., and Copley Rd., Upper Darby, Pa., secretary.

New York State Veterinary Medical Society, Annual meeting. Concord Hotel, Kiamesha Lake, N. Y., Sept. 19-21, 1956. L. W. Goodman, 2303 Northern Blvd., Manhasset, general chairman; Miss Joan S. Halat, 803 Varick St., Utica, secretary.

Washington State Veterinary Medical Association. Annual meeting. Davenport Hotel, Spokane, Sept. 21-22, 1956. P. J. Pfarr, 6306 N. Wall St., Spokane 53, general chairman.

Oklahoma conference for veterinarians. School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Sept. 27-28, 1956. A. L. Malle, Department of Veterinary Pathology, chairman.

Missouri, University of. Annual short course for veterinarians. School of Veterinary Medicine, University of Missouri, Columbia, Oct. 1-2, 1956. Cecil Elder, chairman, short course committee.

Eastern Iowa Veterinary Association, Inc. Annual meeting. Hotel Montrose, Cedar Rapids, Oct. 4-5, 1956. Forrest E. Brutsman, Traer, secretary.

South Dakota Veterinary Medical Association. Annual meeting. Hotel Cataract, Sioux Falls, Oct. 4-5, 1956. J. L. Noordsy, Marion, S. Dak., secretary.

American Veterinary Medical Association. Annual meeting. Municipal Auditorium, San Antonio, Texas, Oct. 15-18, 1956. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Veterinary Symposium on Dogs. Kankakee Civic Auditorium, Kankakee, Ill., Oct. 24, 1956. Mr. Harry Miller, Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y., director.

Mississippi Valley Veterinary Medical Association. Annual meeting. Hotel Pere Marquette, Peoria, Ill., Nov. 7-8, 1956. William L. Beer, 612 N. College Ave., Aledo, Ill., secretary.

U. S. Livestock Sanitary Association. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 28-30, 1956. R. A. Hendershott, 33 Oak Lane, Trenton 8, N. J., secretary.

Animal Care Panel. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 29-30, 1956. Robert J. Flynn, P.O. Box 299, Lemont, Ill., secretary.

Nebraska Veterinary Medical Association. Annual meeting. Hotel Lincoln, Lincoln, Dec. 3-5, 1956. W. T. Spencer, 1250 North 37th St., Lincoln, secretary.

Foreign Meetings

Veterinary Conference, Jamaica Branch, British Caribbean Veterinary Association, Jamaica, B.W.I., July 28-Aug. 8, 1956. C. L. Bent, Veterinary Division, Department of Agriculture, Hope, Kingston, Jamaica, B.W.I. honorary secretary.

Tenth International Congress of Entomology. McGill University and University of Montreal, Montreal, Canada, Aug. 17-25, 1956. J. A. Downes, Division of Entomology, Science Service Bldg., Ottawa, Ont., Canada, secretary.

International Association of Hydatidology. Sixth Congress. Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, 1 MacKenzie King St., Athens, Greece, general secretary.

British Veterinary Association. Annual Congress. Royal Leamington Spa, Leamington, England, Sept. 16-22, 1956. Mr. F. Knight, 7, Mansfield St., Portland Pl., London, W.1, general secretary.

(Continued on p. 35)

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(COMING MEETINGS—*continued from p. 34*)

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. W. R. Laster, Jr., 213 N. 15th St., Birmingham, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Pima County Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth

(*Continued on p. 36*)

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Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Jacksonville Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. George F. Yopp, 4644 Main St., Jacksonville, Fla., Secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. Ross E. Evans, 5215 S. Dixie Highway, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

Suwannee Valley Veterinary Association, the third Friday of each month, at the Thomas Hotel, Gainesville, Fla. R. C. Mann, Rt. 1, Box 37, Ocala, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month, except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville

(*Continued on p. 38*)

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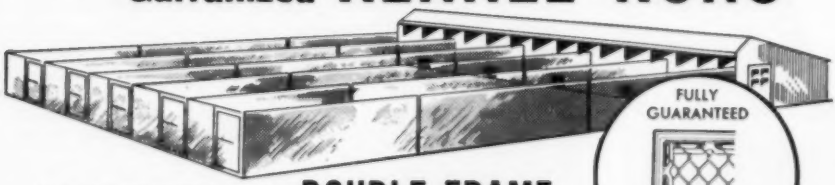

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or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. J. W. Peace, High Point, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. Wm. Allen Potts, 401 W. James St., Mount Olive, secretary.

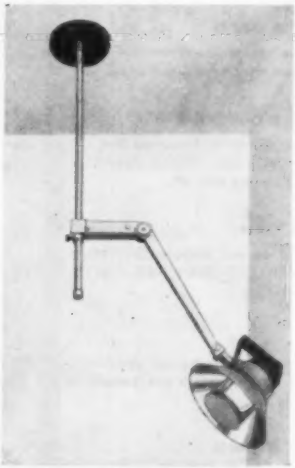
Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

(*Continued on p. 40*)

get the "right light" on surgery with Jen-Sal's ceiling model lamp

Designed for maximum flexibility, lamp head tips, tilts, rotates or angles. Chrome plated ceiling rod allows 2′ vertical adjustment. White enamel floating arm rotates in 3′ circle. Mirror finish aluminum reflector is 10½″ in diameter. Gives 1500 foot-candle of heat-filtered, color-corrected white light. No special wiring necessary. Order by number please.



JSA-53K-84, ceiling light, $79.75

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Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri

advanced instrument designs for advanced veterinary surgery

NOT TOUGH ENOUGH

. . . to fight car sickness. Help him out with

BONAMINE*

BRAND OF MECLIZINE HYDROCHLORIDE

Prevent car sickness effectively with a single daily dose

Bonamine is also indicated:

- **to control nausea of worming**
- **in "nervous" gastritis**
- **to prevent regurgitation in brachycephalics**
- **where a mild calming effect is desired**
- **whenever a reliable anti-nauseant is required**

Daily Dosage: **½ tablet for animals 2 to 5 lb. in weight, 1 tablet for 5 to 20 lb., 1 to 2 tablets for 20 to 50 lb., and 2 to 3 tablets for larger animals.**

Supplied: **Bonamine Tablets, 25 mg., in boxes of 8; bottles of 100 and 500.**

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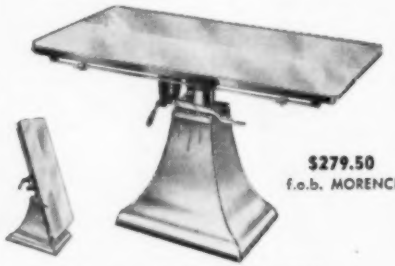
Department of Veterinary Medicine Pfizer **PFIZER LABORATORIES, Brooklyn 6, N. Y.**
Division, Chas. Pfizer & Co., Inc.

WORLD'S FINEST STAINLESS STEEL OPERATING TABLES

made exclusively for Veterinarians



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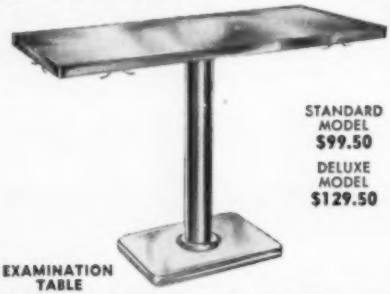
HYDRAULIC OPERATING TABLE

Features precision-made hydraulic unit guaranteed for life of the table. Finger-touch control raises, lowers and locks table in seconds. Large 24" x 60" top. Movable on concealed casters.



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$99.50

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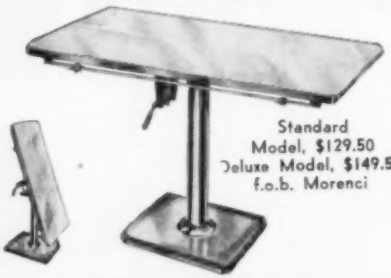
Reinforced stainless steel top in 22" x 48" size. Six tie clamps. Patented "corner compensators" automatically level table on any surface. Designed for examination and pre-surgery treatment.



Standard Model, $129.50
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STAINLESS STEEL OPERATING TABLE

Chrome plated single pedestal and base combined with reinforced stainless steel top. Positive locking adjustment in twelve positions. Super size 24" x 60" top.

ALL MODELS AVAILABLE FROM LEADING SUPPLIERS

TED STOCKWELL MFG. CO.

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(COMING MEETINGS—*continued from p. 38*)

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. James M. Brown, 2818 W. Britton Rd., Oklahoma City, secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary St., Richmond 20, Va., secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R. Des Rosiers, 5508 2nd Ave., N. W., Seattle 7, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

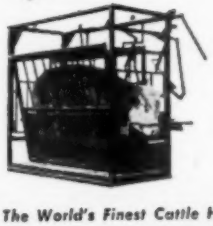
WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W., Huntington, W. Va., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

A sea water evaporating and distilling plant, with a capacity of 8,000 tons daily, will be completed in 1958 on the Island of Aruba in the Caribbean. The island is practically without rainfall.—*Science, May 4, 1956.*

LOOK!

CATTLE CHUTE



- The Chute with a Side Exit
- Left or Right Side Brand
- Automatic Head Adjustor
- Also Calf Cradles, Corrals, Feeder Bunks, and Stock Racks for Pickups

Dealers Wanted
W-W CATTLE CHUTE COMPANY
Dodge City, Kansas

The World's Finest Cattle Handling Equipment

FIVE SPECIAL FORMULAE Prescription Diets

FOR DOGS and CATS

EFFECTIVE WHEN NUTRITIONAL THERAPY IS INDICATED

1. p/d for Reproduction and Lactation
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DISPENSED ONLY BY GRADUATE VETERINARIANS

WRITE FOR INFORMATION ON THERAPEUTIC FEEDING

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(Inquiry form for graduate veterinarians only)
HILL PACKING COMPANY, Box 148, Topeka, Kan.
Send information on therapeutic feeding ☐
Send information on other Hill products ☐
NAME _____
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Personal Want Ads—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

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***For JOURNAL dated 1st of month* — 8th of month preceding date of issue.**

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Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted with some experience for small animal hospital; good salary, apartment available. Address Owen Animal Hospital, 7737 Gratiot Ave., Detroit, Mich.

Nationally established, ethical, manufacturer distributor of veterinary pharmaceuticals offers extraordinary opportunity for veterinarian or college graduate experienced as pharmaceutical sales representative. Write now. Address "Box N 14," c/o JOURNAL of the AVMA.

Veterinarian wanted for assistant in small animal practice; opportunity for rapid advancement in salary commensurate with ability; experience not necessary. Give qualifications, references, and state acceptable starting wage; Indiana license required. Address "Box P 1," c/o JOURNAL of the AVMA.

Opening in a distinguished eastern laboratory for veterinarian interested in scientific care of laboratory animals, experimental pathology, and biological research. Large breeding colonies. Address "Box P 10," c/o JOURNAL of the AVMA.

Wanted—Positions

Graduate, 1953, desires permanent position in small animal or mixed practice with possibility of future partnership. Available late in September after discharge from service. One year's experience in mixed practice; licensed in Kentucky and Ohio. Age 28, married, 2 children. Address "Box P 12," c/o JOURNAL of the AVMA.

(*Continued on p. 44*)

To provide maximum protection against canine distemper, use an antigen that has demonstrated the ability to elicit a solid, durable immunity in young dogs before street exposure.

AVIANIZED® CANINE DISTEMPER

The Lederle strain of distemper virus, modified by serial passage in an unnatural host — the chick embryo. Each lot is potency tested in ferrets. Vacuum-dried for stability.

Vaccinate puppies as soon as possible after weaning, at time of their *first* hospital visit. Permanent immunity normally develops within 10 days. When indicated, provide temporary protection with antiserum until permanent immunity is developed.

1 TO 2 WEEKS AFTER WEANING:
Antiserum and distemper vaccine.

2 WEEKS LATER:
Hepatitis and leptospirosis vaccines.

2 WEEKS LATER:
Second dose, hepatitis and leptospirosis vaccines.

5 TO 6 MONTHS:
Rabies vaccine.

Products to use:

AVIANIZED® CANINE DISTEMPER VACCINE Modified Live Virus
(Chick Embryo Origin-Vacuum Dried)

ANTI-CANINE DISTEMPER SERUM and ANTI-INFECTIOUS CANINE HEPATITIS SERUM
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INFECTIOUS CANINE HEPATITIS VACCINE Canine Origin
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LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN
(Whole Culture Inactivated)

AVIANIZED RABIES VACCINE Modified Live Virus
(Chick Embryo Origin—Vacuum Dried)

Available to graduate veterinarians only.

Lederle LEDERLE LABORATORIES DIVISION

VACCINE

AMERICAN CYANAMID COMPANY PEARL RIVER, NEW YORK

(CLASSIFIED ADS—*continued from p. 41*)

Graduate, 1954, desires position in mixed practice; married, 27, discharged from service, July, 1956. Address "Box P 2," c/o JOURNAL of the AVMA.

Veterinarian with Swiss diploma, several years of experience in the veterinary-bacteriology laboratory, at present employed in a Swiss University, seeks a suitable position in the United States. Address "Box P 5," c/o JOURNAL of the AVMA.

Wanted—Practices

Capable, young, married veterinarian wishes to purchase or lease established small animal practice; experienced. Also consider partnership arrangement. Address "Box P 4," c/o JOURNAL of the AVMA.

Veterinarian currently in the Army desires to purchase small animal hospital in Connecticut. Also consider Pennsylvania, Ohio, New York, or Florida. Address "Box P 8," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Combination veterinary clinic and boarding kennels for sale in Ohio; office, examination room, surgery-pharmacy; room for dog bath. Capacity, 50 dogs; outside runs for each cage. Living quarters and parking area. Price, $18,750; down payment, $4,500-$5,000; balance $85 monthly, 5% interest. Address "Box P 11," c/o JOURNAL of the AVMA.

Excellent, established mixed practice for sale near Indianapolis, Ind.; two-story building with small animal hospital on first floor and 6-room apartment above. Priced at $25,000. Address "Box K 9," c/o JOURNAL of the AVMA.

Mixed practice, approximately 90% dairy cattle, for sale in Wisconsin; drugs and equipment, including 2-way radio; no real estate. Address "Box N 1," c/o JOURNAL of the AVMA.

Veterinary practice established 37 years for sale; includes property, drugs, instruments; write for particulars. Retiring. Address Dr. T. J. Claffey, Route 2, Oconomowoc, Wis.

Excellent, newly established, small animal clinic for sale in large Texas city; has great potentialities: $10,000 down plus inventory (optional). Will finance balance. Address "Box M 7," c/o JOURNAL of the AVMA.

Lucrative small animal practice for sale in New England; 7-room house, hospital, kennel building, 50 cages, equipment, 6½ acres. Owner moving to another state. Address "Box P 3," c/o JOURNAL of the AVMA.

Small animal practice for sale in Washington, D.C.; established 25 years; $15,000. No real estate. Address "Box P 6," c/o JOURNAL of the AVMA.

(*Continued on p. 45*)

Jen-Sal

small animal
therapy note

Canine Wart Vaccine: a practice builder

Your clients will be highly pleased with the dramatic results obtainable with Jen-Sal's Canine Wart Vaccine. This product is prepared from canine oral papillomas and in tests has proved 100% effective following two subcutaneous 2 cc. injections. The suggested dosage is 2 cc. subcutaneously, or 0.5 cc. intradermally, at 10 to 14 day intervals. Another contribution to small animal medicine from Jen-Sal research.

six 2 cc. vials
code: Walto $6.00

Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri

Small animal practice for sale; real estate, nearly 1 acre, improved; residence, hospital, and cottage for kennel help. Price, $25,000; LaCrescenta, Calif. Address "Box P 7," c/o JOURNAL of the AVMA.

Want to retire; will lease or sell one of southern California's finest boarding kennels; ideal for clinic. Nets $20,000 a year. Address "Box P 9," c/o JOURNAL of the AVMA.

Miscellaneous

Medical coach veterinary mobile unit demonstrator on 1955 ¾ ton deluxe Ford pickup; completely equipped, 15,000 actual miles; looks and operates like new; $2,750. Contact R. C. Sutton, Box 121, Albany, Ga.

Artificial Udder—Beco Litter Feeder—nurses 8 puppies simultaneously. Stays warm; easily cleaned and sterilized. Complete unit, $15; guaranteed. Breeders Equipment Co., Flourtown, Pa.

For sale—veterinary equipment, large and small animals; write for list. Address Dr. S. E. Hershey, P.O. Box 283, Charleston, W. Va.

Pregnancy diagnosis in mares—45th to 150th day. Request mailing tubes; $7.00, 2 or more, $6.00 each. Pregnancy Diagnostic Laboratories, Dysart, Iowa.

Breedersleve—The disposable obstetrical sleeve. Package of 25 with detachable chest band, $5.00; lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

Send for FREE 36-page Treatise on

CARROT OIL VITAMINS

Details the advantages of carrot oil vitamins when used in feeds to improve breeding results; to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today.

NUTRITIONAL RESEARCH ASSOCIATES
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Eaton Appoints Veterinary Sales Manager

Warren L. Martin has been named manager of the new veterinary sales division of Eaton Laboratories, according to L. E. Daily, M.D., vice president. Mr. Martin received extensive training in naval Medical Corps schools and spent six years in the U.S.N. Medical Corps on active duty in the South Pacific. He has been a medical representative for the William S. Merrell Co., and veterinary representative for Winthrop Laboratories, Inc.

You can't beat WAYNE for GOOD PUP PRODUCTION

You can *see* and *count* the difference when you feed Wayne Dog Food. Gives your pups *new life!* Makes them grow into strong, sturdy dogs . . . with glossy coats and superior stamina.

Valuable coupons on the back of every bag

...it's a real 'TAIL WAGGER'

WAYNE DOG FOOD

ALLIED MILLS, INC., Dog Food Division, Ft. Wayne, Ind.

Veterinarians Prefer the NEW

Sunbeam STEWART CLIPMASTER

NEW More Powerful Motor . . . 25% greater speed

CLIPS Dogs, Horses Cows, Mules faster, better

Clip your animals the fast, easy way with the new Sunbeam Stewart electric Clipmaster. Has quiet, powerful, air-cooled, ball-bearing motor inside the cool Easy-Grip handle. Anti-friction tension control assures perfect tension between blades, provides easy adjustment. $42.50 (Colorado and West $42.75).

Grooming Head Fits Your Clipmaster

Special bottom clipping blades for all breeds of dogs. Grooming brush, drill head, sheep shearing attachments, give Clipmaster year 'round use.

Sunbeam CORPORATION
Dept. 47, 5600 W. Roosevelt Road, Chicago 50, Ill.

yes, I'd welcome samples of both-

IODEX
PLAIN OINTMENT

Indicated primarily for its iodine content—as in swollen glands, boils, minor wounds, skin eruptions, irritations and infections.

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CUM METHYL SALICYLATE OINTMENT

Indicated for its counter-irritant action—as in lameness, strains, and other painful muscle, tendon and joint involvement.

Both forms of Iodex supplied in tubes of 1 oz. and jars of 1, 4, and 16 oz.

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SAFE . . . SURE . . . EASY

USE **BURDIZZO**
BLOODLESS CASTRATOR
USED SUCCESSFULLY
OVER 30 YEARS. YOU GET . . .

- Minimum growth set back
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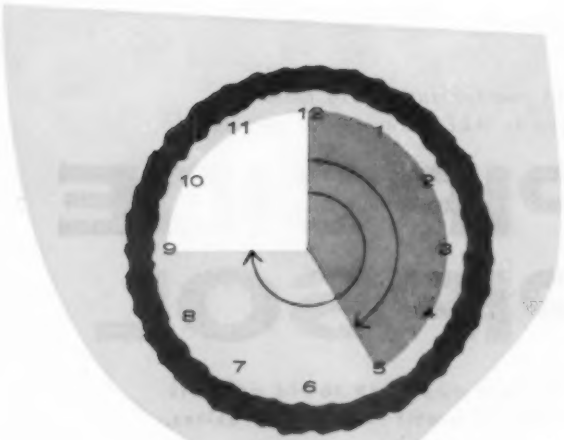
Ask your dealer for the original bloodless castrator made by La "Burdizzo" Co., Turin, Italy

BE SURE IT'S STAMPED WITH THE WORD **BURDIZZO**

NOW...

25- to 45-minute anesthesia



from a single intravenous dose

NEW — **Combuthal®**

(Pentothal® Sodium — Nembutal® Sodium, Abbott)

. . . smooth, rapid induction in 3½ to 5 minutes.

. . . profound anesthesia for 25 to 45 minutes.

. . . short, quiet recovery in 30 to 60 minutes.

Abbott

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NEW anthelmintic in powder and liquid form that can be given to ALL animals.. of any age!

PIPCIDE
PIPSOL

the up to date approach to rid animals and poultry of profit robbing parasites.

Realize numerous advantages from these anthelmintics:

1. Worm pigs of any age — baby pigs to pregnant sows.
2. Preliminary fasting is not necessary.
3. There is a wide range between therapeutic and toxic dosage.
4. Pipcide and Pipsol are water soluble. Animals may be treated individually, in drinking water, or in wet or dry feed.
5. Swine heavily parasitized or with irritated intestinal tracts can be successfully treated with little danger to the host.

These are but a few of the advantages given your clients when dispensing Pipcide or Pipsol.

HAVER-GLOVER *Laboratories*

See HAVER-GLOVER MESSENGER for formula and price.

Lockhart's
SINGLE INJECTION PROTECTION
against canine distemper
for dogs of all ages and breeds

Ashe Lockhart's Modified Live Virus Canine Distemper Vaccine (Chick Embryo Origin) has successfully immunized dogs of all ages and breeds against Canine Distemper. Since only one injection is required, it is economical in both cost and time.

Prepared by serial passage of modified canine distemper virus in embryonated eggs, the product is vacuum-dried and vacuum-sealed to insure stability and potency for long periods. A single injection develops a solid, long-lasting immunity.

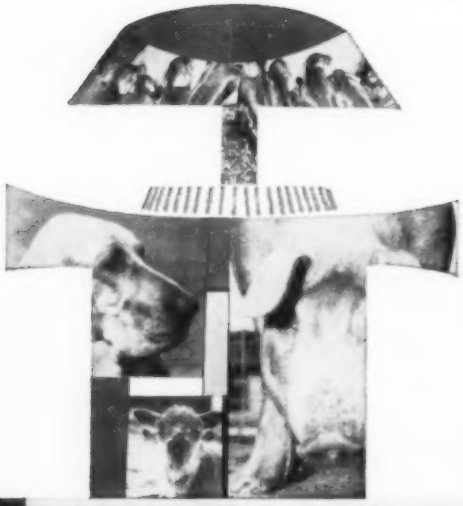
Lockhart's Modified Live Virus Canine Distemper Vaccine can be given simultaneously with a prophylactic dose of Anti-Canine Distemper Serum and Anti-Infectious Canine Hepatitis Serum (Lockhart). This provides passive immunity against *both* diseases, eliminating any possible sub-clinical, latent infection while the animal is being immunized against canine distemper.

Lockhart's Modified Live Virus Canine Distemper Vaccine (Chick Embryo Origin) is available only to graduate veterinarians.

LOCKHART

ASHE LOCKHART, INC.

800 WOODSWETHER ROAD KANSAS CITY 6, MISSOURI

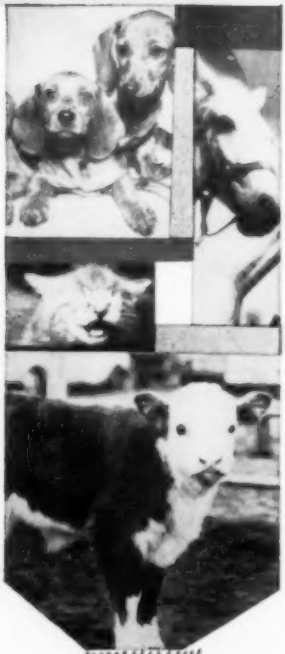


PARENTERIN produces consistent results in four to six hours without cramping, nausea or drastic purgation. Because of its mild action, it is safe for the young, old or debilitated patient. Also valuable in rumen stasis.

Jen-Sal

long acting, injectable laxative

priced for routine use



Administer PARENTERIN intramuscularly or subcutaneously. Large animals, 10 to 20 cc.; small animals, 1 cc. per 20 pounds body weight. The recommended dose may be repeated in six to eight hours without danger of toxicity. PARENTERIN contains 20% soluble glycosides of cascara sagrada in aqueous solution. It has proved to be approximately ten times as effective as the official U. S. P. extract of cascara. Supplied in cartons of 6—100 cc. vials.

Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri

PARENTERIN